

Nema World Household Sales Total 245,614 Units in February

The following 15 member companies of the Refrigeration Division of the National Electrical Manufacturers Association (Nema) reported household refrigerator sales for February, 1937: Apex Electrical Mfg. Co., Crosley Radio Corp., Fairbanks, Morse & Co., Frigidaire Corp., General Electric Co., Gibson Electric Refrigeration Co., Kelvinator Corp., Leonard Refrigerator Co., Norge Corp., Servel, Inc. (export only), Stewart-Warner Corp., Sunbeam Electric Mfg. Co., Uniflow Mfg. Co., Uni-

versal Cooler Corp., and Westinghouse Electric & Mfg. Co. Member companies not reporting included: Jomoco, Inc., Merchant & Evans Co., and Sparks-Withington Co.

The sales of the reporting companies do, however, include units manufactured for the following concerns: Major Appliance Corp., Montgomery Ward & Co., Potter Refrigerator Corp., and Sears, Roebuck & Co.

SALES FOR FEBRUARY, 1937							
Lacquer (Exterior) Cabinets Complete		Domestic		Canadian		Other Foreign	
	Quantity	Value	Quantity	Value	Quantity	Value	
1.	633	\$ 27,728	2	\$ 97	85	\$ 4,420	
2.	10	603					
3.	3 to 3.99 cu. ft.	3,727	219,156	181	10,308	3,087	182,577
4.	4 to 4.99 cu. ft.	20,392	1,345,587	803	58,273	4,959	328,884
5.	5 to 5.99 cu. ft.	53,699	4,150,294	710	56,859	1,541	125,778
6.	6 to 6.99 cu. ft.	85,505	7,217,705	316	29,393	1,166	108,679
7.	7 to 7.99 cu. ft.	24,259	2,454,799	235	23,773	699	73,149
8.	8 to 8.99 cu. ft.	7,296	796,246	2	231	217	25,679
9.	9 to 12.99 cu. ft.	33	4,178	.....	.....	.....	.....
10.	13 cu. ft. and up	.....	.....	.....	.....	.....	.....
11.	Total Lacquer	195,554	16,216,296	2,249	173,934	11,704	849,166
Porcelain (Exterior) Cabinets Complete							
12.	Up to 4.99 cu. ft.	394	30,832	81	6,479	44	3,448
13.	5 to 5.99 cu. ft.	6,949	617,025	50	4,405	245	21,351
14.	6 to 6.99 cu. ft.	13,424	1,327,031	29	2,858	152	15,554
15.	7 to 7.99 cu. ft.	5,706	626,859	7	759	143	15,710
16.	8 to 9.99 cu. ft.	4,284	519,494	3	382	96	12,207
17.	10 to 12.99 cu. ft.	266	48,068	.....	.....	49	8,063
18.	13 cu. ft. and up	323	63,528	1	255	27	4,885
19.	Total Porcelain	31,346	3,232,837	171	15,138	756	81,218
20.	Total—Lines 11 and 19	226,900	19,449,133	2,420	189,072	12,460	930,384
21.	Separate Systems 1/2 Hp. or Less	73*	10,548*	274	9,111	754	38,098
22.	Separate Household Evaporators	1,705	13,176	56	822	1,118	7,927
23.	Total—Lines 20, 21, 22	228,532	.....	2,750	.....	14,332	.....
24.	Condensing Units 1/2 Hp. or Less	344	21,758	25	1,560	518	31,039
25.	Cabinets—No Systems	206	21,124	4	152	159	6,267
26.	Total Household	.....	\$19,494,643	.....	\$200,717	.....	\$1,013,715
* Includes sales and credits reported by more than one company.							

*Includes sales and credits reported by more than one company.

Book Review

How to Write Good Sales Letters Told in Book Of Tested Examples

"Tested Sales Letters," Author: Herbert H. Palmer. Publisher: McGraw-Hill Book Co., Inc., New York City. Pages 520. Review by Winifred B. Hughes.

The success of an advertising message is measured by actual results, and not by the way in which it measures up to the theories of so-called experts.

This is no less true of direct-mail advertising than it is of advertisements that appear in publications. It is especially true of the branch of direct-mail advertising with which this book deals—the sales letter.

In preparing this book, the author has acted more as a compiler, his work being to present letters that have been proved effective and, by analyzing them, to try to discover and point out briefly, the reasons for their success.

Successful sales letters form the backbone of this volume, the author merely linking them together with sufficient material to form the continuity in each chapter.

Although the author claims early in the book that it is impossible to set up any cut-and-dried formula for preparing a successful sales letter, he enumerates the following guiding principles for the one preparing a direct mail piece.

1. It's the reader that counts. Give your letter the you-attitude.

2. Meet your reader face-to-face and always make him think well of himself by treating him with courtesy.

3. Win respect for your firm and yourself by accepting responsibility when you have failed to serve.

4. Be sincere.

5. Be serious but not deadly in your seriousness.

6. Treat your reader as you like to be treated.

7. Cultivate tact.

8. Above all, write interested and cordial letters.

The book gives a comprehensive picture of the many uses to which direct mail can be put. Among the

tested-and-proven paragons contained in its pages are letters designed to accomplish the following purposes: to get the direct sale; to build good will; to attract customers to the store; to revive inactive accounts; to stimulate dealer sales. "Stunt" letters, humorous letters, and letters written around some special event or occasion are others which the book discusses.

Of special interest to electrical appliance dealers is the chapter containing letters to attract customers. Any retailer can attract buyers to his store, the book claims, if he picks out some store event of timely interest, some appealing item or line or merchandise and talks about it enthusiastically to people who could logically be interested in it.

The recipe given for this type of letter, is: use a short opening paragraph (preferably one line) dealing with current happenings of general interest, or with seasonal appeals of interest to the reader. Paragraph two leads out of the opening phrase into the message selected for the letter.

"Have something to say, write it in the first person with a human slant and as a letter . . . And to be human, just be natural."

This simple plan, the book states, is equally suitable for the retailer in the small town who knows most of his customers by name, and for the large metropolitan department store. It requires no elaborate machinery and no professional talent.

Among the model traffic pulling letters are a series to the same mailing list, each of which uses a different approach to play up the "come-in-and-get-acquainted" message; a set directed to a selected list of customers urging them to take advantage of credit privileges, and a group of letters in which a merchant uses the names of employees who have been with him for many years, as the bait intended to lure new prospects into his store.

Direct mail offers the manufacturer or distributor handling high priced and highly specialized merchandise an economical and efficient method of getting personalized coverage that makes it, in many cases, preferable to other types of advertising which he might employ, the book points out.

It can be used to prepare the way for the salesman's call, to obtain direct leads by soliciting inquiries for booklets, to familiarize the public with a new product or service. In general, a good sales letter will effectively break down resistance and get the message across so that the sales representative's work will be simplified and his productivity increased.

Not only does the author give ample coverage to individual types of sales letters, but he also gives considerable attention to the complete direct mail campaign.

In two chapters which he devotes to this subject, the author points out the variety of purposes for which campaigns may be conducted, and illustrates the type of letter and style of language most commonly found successful. He emphasizes the

Pennsylvania Presses New York for Lead in February State Sales

States and Territories	Quantity Household Low Sides
Alabama	2,997
Arizona	950
Arkansas	1,210
California	9,841
Colorado	2,022
Connecticut	4,640
Delaware	440
Dist. of Columbia	1,287
Florida	2,474
Georgia	4,339
Idaho	909
Illinois	17,915
Indiana	6,610
Iowa	4,538
Kansas	2,445
Kentucky	2,698
Louisiana	2,569
Maine	983
Maryland	2,528
Massachusetts	10,732
Michigan	11,411
Minnesota	2,746
Mississippi	1,252
Missouri	6,525
Montana	1,098
Nebraska	1,989
Nevada	233
New Hampshire	599
New Jersey	8,287
New Mexico	534
New York	24,936
North Carolina	5,176
North Dakota	611
Ohio	16,863
Oklahoma	2,565
Oregon	1,761
Pennsylvania	23,965
Rhode Island	1,628
South Carolina	2,429
South Dakota	523
Tennessee	3,957
Texas	9,173
Utah	1,174
Vermont	725
Virginia	3,365
Washington	3,233
West Virginia	3,156
Wisconsin	6,238
Wyoming	252

Total United States	228,532
Canada	2,750
Other Foreign (Including U. S. Possessions)	14,332
Total for World	245,614

importance of a thorough analysis of background facts and conditions.

Definitely and clearly determining the objective should be the first step in preparing the campaign, the author states.

Then before the letters are prepared, he continues, the nature and condition of the firm's own business should be examined, competitive factors should be weighed, the mailing list compiled, the buying habits of the potential or actual markets analyzed, the mechanical details planned, and the costs computed.

Several complete campaigns are presented with sufficiently detailed background to enable the reader to see just what was being attempted, the procedure that was followed, and the results then obtained. Delving into the question of when and why letters should be sent to dealers is the author's concern in Chapter XII of Tested Sales Letters. Among the uses of the sales letter in this field, he points out the following: to sell direct, to secure inquiries, to place samples, to inform, instruct, or stimulate, to maintain morale and build good will.

Letters to sell direct to dealers, the book states, are no different in principle from letters to sell direct to consumers. They must follow the usual sales formula of attention, interest, desire, conviction, action, just as they would if written to the consumer.

Such letters may use any of the devices or methods of accomplishing these functions that may be used in the consumer letter. They may be long or short, mild or urgent, dignified or informal, as the case requires.

The one particular in which they differ materially from the letter to the consumer is that they must convince the dealer that the article will sell, in such quantities and at such a figure that it will be worth his while to handle it. To do this, the book claims, the direct-sale letter to the dealer must consist mainly of a "reason-why" appeal, couched in language that is sincere, straightforward, and convincing.

Discussing the compilation and maintenance of the mailing list, the book tabulates some of the sources where good names can be secured, and gives numerous suggestions whereby the merchant can improve his mailing list. It presents a detailed and elaborate analysis on the subject of mailing list maintenance.

Liversage Chalks Up 33 Range Sales in 26 Days

MOBILE, Ala.—Thirty-three electric range sales in 26 days, each range selling for an average of \$275, is the record established by George Liversage, star salesman of the Mobile division of Alabama Power Co.

Mr. Liversage also has the distinction of selling five water heaters in one day.

BUYER'S GUIDE

SUPPLIERS WHO SPECIALIZE IN SERVICE TO THE REFRIGERATION AND AIR CONDITIONING INDUSTRIES

CATALOG NO. 11

INTRODUCES

THE GREAT CHANCO HIGH SIDE

GET ALL DETAILS — WRITE ON YOUR LETTERHEAD

H. CHANNON CO.

133 N. WACKER DRIVE

CHICAGO

TEL. FRANKLIN 0380

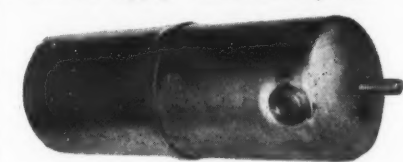
"SUPPLIES — TOOLS — EQUIPMENT — PARTS"

HARRY ALTER'S
1937 catalog of
Air Conditioning
and Refrigeration
Parts and Supplies.
Write on your letterhead.
We protect the dealer.

HARRY ALTER COMPANY
1728 S. Michigan Ave., Chicago
BRANCHES
NEW YORK · ST. LOUIS · CLEVELAND

BRAZED IN CONTROLLED ATMOSPHERE

This receiver tank is made with special stampings brazed in a controlled atmosphere electric furnace. This process is the newest of our facilities for producing Pressed Metal Products. We furnish stampings, assemblies, hydrogen brazing and enameling. Stamped compressor bases are one of the many items we supply. Check us for prices.



Acklin

THE ACKLIN STAMPING CO.
Toledo, Ohio Chicago, Illinois
Detroit, 2-165 General Motors Bldg.

Expert REBUILDING & REPAIR

General Electric MONITOR TOP UNITS \$25

All Household Models

MAJESTIC HERMETIC UNITS—\$20.50

SERVEL HERMETIC UNITS—\$18.50

F.O.B. OUR FACTORY

One Year Unconditional Guarantee

A complete rebuilding and replacement service. All units tested for temperature, cycling, wattage consumption and quietness. Thousands of units rebuilt in past seven years. We guarantee satisfaction.

REFRIGERATION MAINTENANCE CORP.
365 EAST ILLINOIS ST. — CHICAGO, ILLINOIS

PARTS-SUPPLIES-TOOLS for REFRIGERATION-AIR CONDITIONING

Complete Stock—Quick Service

One-day service on your order for any parts, supplies or tools you may need for any type of refrigerator or air conditioner. QUALITY MERCHANDISE, absolutely guaranteed and offered at the lowest prices. Deal with us—obtain all your needs from one source—and rely absolutely on getting exactly what you order. WHOLESALE ONLY for your protection. Request big, complete, new catalog on your business card or letterhead. It's FREE.

AIRO SUPPLY CO. 2732 N. Ashland Ave., CHICAGO
17 West 60th Street, NEW YORK

ALL YOUR NEEDS FROM ONE SOURCE

SEND FOR BIG FREE CATALOG

BOUND VOLUMES OF THE NEWS

Each of the following volumes contains all weekly issues of Electric Refrigeration News, later Air Conditioning and Refrigeration News, issued during a period of four months. Stiff paper board covers.

Vol. 8—Jan 4 to April 26, 1933. (Serial Nos. 198 to 214.)	
Vol. 9—May 3 to Aug. 30, 1933. (Serial Nos. 215 to 232.)	
Vol. 10—Sept. 6 to Dec. 27, 1933. (Serial Nos. 233 to 249.)	
Vol. 11—Jan. 3 to April 25, 1934. (Serial Nos. 250 to 266.)	
Vol. 12—May 2 to Aug. 29, 1934. (Serial Nos. 267 to 284.)	
Vol. 13—Sept. 5 to Dec. 26, 1934. (Serial Nos. 285 to 301.)	
Vol. 14—Jan. 2 to April 24, 1935. (Serial Nos. 302 to 318.)	
Vol. 15—May 1 to Aug. 28, 1935. (Serial Nos. 319 to 336.)	
Vol. 16—Sept. 4 to Dec. 25, 1935. (Serial Nos. 337 to 353.)	
Vol. 17—Jan. 1 to April 29, 1936. (Serial Nos. 354 to 371.)	
Vol. 18—May 6 to Aug. 26, 1936. (Serial Nos. 372 to 388.)	
Vol. 19—Sept. 2 to Dec. 30, 1936. (Serial Nos. 389 to 406.)	

Price \$3.00 per volume, f.o.b. Detroit. Shipment will be made by express collect unless otherwise specified. Please send remittance with order.

Business News Publishing Co., 5229 Cass Ave., Detroit, Mich.

A Few of the BARGAINS in our New Catalogue

MANUFACTURERS CLOSEOUTS

BRAND NEW IN ORIGINAL CARTONS OR CRATES

CHIEFTAIN (Tecumseh) CONDENSING UNITS 1/4 H. P. Single cylinder less motor...\$21.50 with motor... 27.75	JOMOCO (Johnson) CONDENSING UNITS 1/4 H. P. Single cylinder less motor...\$19.95 with motor... 26.00	WAGNER MOTORS—Late Type Capacitor Model-R. Z. R. BRAND NEW Air cooled condensers suitable for units up to 1/4 H. P. .89
---	---	--

FEDERAL REFRIGERATOR CORPORATION 57 EAST 25TH STREET NEW YORK, N. Y.

Refrigeration PARTS & TOOLS

Bracket strips Pinchoff tools
Bracket adapters Flaring tools
Flange adapters Tube benders
Clamps Valve needles
Tee wrenches Replacement shafts

Above is only partial list of parts and tools which we manufacture and sell thru legitimate jobbers.

Send for new catalog

Superb Metal Products Co.
6956 S. State St., Chicago

REFRIGERATION NEWS

Established 1926 and Registered U. S. Patent Office as Electric Refrigeration News
Member Audit Bureau of Circulations. Member Associated Business Papers.VOL. 20, No. 15, SERIAL NO. 421
ISSUED EVERY WEDNESDAYEntered as second-class
matter Aug. 1, 1927

DETROIT, MICHIGAN, APRIL 14, 1937

Copyright, 1937, by
Business News Pub. Co.FOUR DOLLARS PER YEAR
TWENTY CENTS PER COPYFinal Hearing
Held on N. Y.
Proposed CodeNema Opposes Dept. Store
Provisions; Refrigerant
Dissension Continues

NEW YORK CITY—Final public hearing on the long-debated proposed municipal Code of Ordinances Relating to Refrigerating Systems was held April 7 in the Municipal Building here before the Board of Hazardous Trades with a large group of representatives of refrigerant manufacturers, refrigeration engineers, and other interested parties appearing to discuss code changes.

Francis X. Giaccone, deputy fire commissioner who presided, in summing up the attitude of city authorities, stated that public safety was the prime concern of the fire department and that prompt action on the code by the Board of Aldermen was expected.

In reviewing the long series of debates which have delayed formation of a complete and final code for installation of refrigerating systems over a period of several years, Commissioner Giaccone said that continuous objections to code provisions by private interests have made it difficult for the Board of Hazardous Trades to reach impartial decisions for the benefit of public welfare.

Because of this, the commissioner declared, no more public hearings would be held. One or two executive sessions of the board will be held before the final draft of the code is submitted to the fire department, from which it will go to the Board of Aldermen for action.

R. Bourke Corcoran, appearing for the National Electrical Manufacturers' Association (Nema), requested the board on behalf of Nema to remove paragraph "F" of part 3, Section 219, of the proposed Nov. 24, 1936, revisions.

This paragraph states:

"No refrigerating system or systems for sale or demonstration purposes containing an irritant and/or flammable refrigerant, shall be installed or stored or operated in a department store unless such system or systems be installed or stored or operated in a room cut off from the rest of the building by tight partitions and tight self-closing door or doors. This provision shall not apply to hermetically sealed unit systems containing not more than six (6) pounds of an irritant and/or flammable refrigerant."

"Nema wishes to emphasize," said Mr. Corcoran, "that many features of the proposed code should be amended, but this section puts an unnecessary burden on department stores and should be removed. Under it, they would have to abandon displays of many types of refrigerators."

If the clause which would make department stores display household electric refrigerators in rooms partitioned off from the rest of the building is retained in the code as passed by the Board of Aldermen, Nema is "prepared to use every means at its disposal to fight it," Mr. Corcoran declared.

Considerable dissension was manifest at the hearing over classifications of a list of 18 refrigerants as outlined in Nov. 24, 1936, proposed revisions to the code. Another list of proposed revisions, bearing the date March 23, 1937, was distributed to those in attendance. These, too, came in for heated discussion.

Main discussion centered on the flammability of Freon refrigerant when atomized from small leaks and coming into contact with open flames. Under proposed revisions of Nov. 24, 1936, Freon is classified as "non-irritant and non-flammable."

Robert T. Brizzolara of the R. B. Engineering Corp., who claims to

(Concluded on Page 23, Column 2)

California Plan on 'Trade-ins' Based
On Arbitrator's Bid for Used Boxes

By Clarence F. (Sandy) Pratt

President of the California Refrigerator Co., Refrigeration Supply Jobber

Editor's Note: Recently, at the request of the Quad City Electrical Refrigeration Council which has its headquarters in Rock Island, Ill., Mr. Pratt wrote an outline of the plan on "trade-ins" which has been used successfully in the northern part of California for the past four years. At the same time he sent a copy to the News, from which the following article was prepared for the benefit of other dealer groups who may be seeking a solution to the "trade-in" problem.

Most refrigeration dealer associations in northern and central California meet often. Among other things, they agree at these meetings on prices for used mechanical refrigerators to be allowed when a deal is being made for a new electric or gas refrigerator. (New ice boxes are not sold by California dealers. Ice companies only sell them.)

Generally speaking, an official of the California Refrigerator Co. is called into these meetings, or is

asked to submit in advance a list of suggested prices for "trade-ins."

If a "trade-in" allowance is agreed on for a used ice box, the understanding among dealers is that the old ice box should not be removed from the customer's premises, unless it be one of the latest models (see ice box schedule at end of this plan).

The California Refrigerator Co., being a wholesaler in parts and supplies for all makes of refrigerators, assumes a neutral attitude toward all dealers, regardless of the make of refrigerator handled.

According to the California Plan, our company either submits a suggested schedule of prices to be used by a certain group of dealers in a particular district, or else one of its officials visits a home or store to appraise a certain refrigerator for any bona fide dealer without obligation on the part of the retailer.

The California Refrigerator Co. will make a cash offer for any machine—regardless of condition—to the

(Concluded on Page 2, Column 4)

Household Test Code
Approved by Nema

NEW YORK CITY—The long-sought code for testing household electric refrigerators has been given final approval by the Refrigeration Division of National Electrical Manufacturers Association, and has been published as the "Nema Household Electric Refrigerator Standards."

The code establishes a method for testing household electric refrigerators, and prescribes the way in which the test data shall be reported. In other words, how the refrigerator shall be rated.

Attempts to formulate a code for testing and rating household electric refrigerators are as old as the Refrigeration Division of Nema itself.

The complete test code for mechanically operated household refrigerators, as approved and made public by Nema, is published on pages 28, 29, and 30 of this issue.

self. Nearly every engineer of prominence in the household section of the industry has served on the Nema technical committee which worked year after year trying to get suitable standards.

As approved, the code calls for a "No Load" test at ambient temperatures of 70° F., 90° F., and 110° F., and for an "Ice Making" test (on the basis of the manufacturer's advertised charge) at the same ambient temperatures.

Reference is made in the code to a "Load Test," which will be added later. It is understood that no agreement has been reached on the method of imposing the load.

Under the "No Load" test the manufacturer, after specifying the ambient temperature and temperature

(Concluded on Page 2, Column 2)

New Commercial Lines
Announced by G-E

CLEVELAND—New lines of General Electric water, beverage, and milk coolers, commercial coils, and a new booklet for food store operators have been announced by W. E. Landmesser, manager of the commercial refrigeration division of General Electric Co.'s appliance and merchandise department.

Three low-priced water coolers are offered, for cup, faucet, and bubbler service.

Model BM-11, for cup service, takes a 2½ or 5-gallon water bottle.

(Concluded on Page 21, Column 1)

Jobbers Will Convene
Nov. 1 in Chicago

CHICAGO—Third annual convention of the National Refrigeration Supply Jobbers' Association will be held on Nov. 1 and 2 in the Stevens hotel here, the association's board of directors decided at a meeting in the Palmer House on April 6.

Provision was made for addition of two new directors, one representing Texas, the other the West Coast. Selection of the new board members was not made at the meeting.

In another noteworthy move, it was decided to adopt an association emblem, to be used in all future cooperative advertising. Members will be asked to use the emblem on their own individual advertising, as well as on their letterheads.

Ratification of several recently approved membership applications was voted, and plans for future promotion and advertising by the association were discussed. Board members also went into the matter of closer cooperation with parts and supplies manufacturers.

Directors present at the meeting were Irving Alter, Harry Alter Co., Chicago; H. W. Blythe, H. W. Blythe Co., Chicago; Leo Gorton, Machine Tool & Supply Co., Tulsa; H. S. McClelland, Williams & Co., Pittsburgh; Henry Merkel, Merkel Bros. Co., Cincinnati; J. M. Ober, J. M. Ober, Inc., Detroit; and Robert Spangler, Spangler Co., St. Louis.

No, the Gangsters Didn't Get
Australia's Mr. Hallstrom

"Those gangsters 'll get you
If you don't watch out!"

The above warning is said to be a frequent jesting farewell for Australians when they depart from the sunny shores of their homeland for the United States. Partly because of exaggerated reports from the Al Capone era, and partly because of American movies, many citizens of kangaroo land seem to have an idea that running gunfire on the streets is a daily occurrence in American cities.

Anyway, when the home office of E. F. Hallstrom's oil-fired refrigerator factory down in Sydney couldn't reach Mr. Hallstrom with cablegrams, they must have thought that the gangsters had got him for sure.

As reported previously in the NEWS, Mr. Hallstrom arrived in this country three weeks ago to study the absorption refrigeration situation over here. His official address

N. Y. Dealer-Utility Battle Looms
Over \$15 Ice Box Trade-in PlanSpecial Features in
This Issue

Starting on page 1: A detailed explanation (with used refrigerator price schedules) of the California plan for handling "trade-in" deals.

A. A. Brown, chairman of the Edison Electric Institute refrigeration committee, warns dealers against "knocking" other makes, and offers suggestions for meeting ice and gas refrigerator competition. Page 4.

William C. Stoner, Crosley retail personnel manager, tells how salesmen can "clock" on the first house call. Page 6.

"What Dealers Are Saying and Doing." A survey among dealers in Long Island City, New York. Pages 8 and 9.

"How Successful Dealers Operate." A story of some of the effective sales ideas and methods used by New Jersey retailers. Pages 10 and 11.

"What are the advantages of mechanical refrigeration over other types of cooling for residences?" Tabulated data from studies made in the Detroit Edison Co. Research Residence, reported on pages 18 and 19.

Prima Brings Out
Refrigerator Line

SIDNEY, Ohio—In connection with the introduction of new washer and ironer models, Prima Mfg. Corp. has announced that it also has available for dealers a line of household electric refrigerators in 4, 5, 6, and 8-cu. ft. capacities.

Addition of the four refrigerator models to the Prima line of appliances is designed to permit the Prima dealer to offer to his customers three companion lines of products under the same trademark, according to E. A. Callies, sales manager.

Dealers will not be required to carry all three Prima appliances, Mr. Callies said, but they are being offered for the accommodation of those outlets that wish to concentrate their lines with fewer manufacturers.

Featured in the new Prima refrigerators are twin-cylinder compressors and a "Humid-I-Pak" evaporator, which, it is claimed, speeds up freezing, cuts current consumption,

(Concluded on Page 2, Column 3)

Association Seeks to Halt
Consolidated Edison's
Electrolux Drive

By W. H. Long

NEW YORK CITY—Rumors of impending court action by the Refrigerator Association of New York, Inc., representing metropolitan distributorships of 10 electric refrigeration manufacturers, to seek injunctions restraining Consolidated Edison Co., Inc., one of its members, from continuing its April sales campaign on Electrolux gas refrigerators with the offer of \$15 for trade-in ice boxes climaxed week-end developments in a bitter dealer-utility controversy here.

Interchange of pointed telegrams between Arthur F. Callahan, managing director of the distributors' association, and E. F. Jeffe, vice president of the utility, left no clue as to action contemplated by either side, and neither Mr. Callahan nor Mr. Jeffe could be reached for official comment.

From a source close to the situation it was learned that the utility's three-day advertising campaign featuring the \$15 trade-in allowance in metropolitan New York and Westchester county newspapers had been cut short following outbreak of widespread dealer protests. Examination of several papers showed that only one advertisement had appeared in New York—that in the "New York Daily News," a tabloid—on Sunday, April 4, and in a few Westchester publications of later date.

Throughout New York and Westchester, Electrolux boxes remain on the showroom floors of dealers selling under the campaign's plan with little or no display window evidence of the \$15 offer for ice boxes traded in on new Electrolux refrigerators.

Despite protests by groups of dealers throughout the territory, there is no sign of any voluntary abandonment of the plan by participating outlets. More than 100 are selling according to the campaign plan based on an April quota of 5,000.

Conflicting statements on the purposes and management of the campaign have left most observers in a quandary. Certain dealers have alleged that the utility is seeking reprisals against electrical appliance dealers who induced it to abandon merchandising of appliances, including refrigerators, in June, 1936.

A source close to the utility alleges that Consolidated Edison ceased merchandising on that date after completion of moves aimed at gradual withdrawal from the selling picture and calculated to turn over all merchandising to independent retail outlets.

It is generally agreed by all dealers contacted by the writer that past relations between the utility and New York and Westchester dealers have been amicable, and that the only bone of contention between

(Concluded on Page 32, Column 1)

171,702 Norge Products
Sold in 1st Quarter

DETROIT—Unit sales of Norge appliances during the first quarter of 1937 totaled 171,702, a gain of 30% over the same period of 1936, reports Howard E. Blood, president of Norge and executive vice president of Borg-Warner Corp.

Sales during March alone totaled 72,402 units, an increase of 24% over the corresponding month of last year, Mr. Blood said.

All-product first quarter business represented 32% of the total business last year, Mr. Blood reported. Increases by products over the first quarter of 1936 were:

Refrigerators, 29%; washers, 21%; commercial high sides, 24%; electric ranges, 523%; furnaces, 571%; oil burners, 117%.

It Wasn't Gangsters After All

(Concluded from Page 1, Column 4)
He didn't seem to know what to do, either.

Finally H. R. Van Deventer, New York patent attorney, was phoned—on the hunch that if Hallstrom was studying patents, Van Deventer might somehow be involved.

The hunch was a good one. In Van Deventer's office at the time was Mr. Keith of Perfection Stove, who had just made arrangements with Hallstrom for the latter to visit the Perfection Stove plant in Cleveland, where Superflex oil-burning absorption refrigerators are made. According to Keith, Hallstrom was registered at the Roosevelt hotel.

In a short time we had Hallstrom on the phone, and the mystery was cleared up—almost.

Plenty of behind-the-scenes finagling appears to be going on in the absorption refrigeration business, and everybody concerned seems to be wearing dark glasses and a false mustache.

Among the factors involved, in addition to Hallstrom, are Sears Roebuck, Allyne Refrigeration Co. of Cleveland, Perfection Stove, and the Stator patent trust in New York City.

There is an unconfirmed report that Perfection Stove will build the Sears Roebuck oil-fired absorption refrigeration line for the 1938 season. During the past year Sears has been field-testing Allyne units.

At any rate, considerable suppressed excitement exists at the moment among producers and pat-

entees of absorption units, fanned by wind of Electrolux progress, and by the mounting demand of distributors for kerosene-operated refrigerators for non-electrified farms.

Nema Code Household Testing Data Given

(Concluded from Page 1, Column 2)
Model RM-11, the faucet type, for ture control position used during the test, will report the following data:

Average cabinet air temperature.

Kwh. per 24 hours.

Per cent running time.

Part of the "No Load" test also calls for recording of data at the "standard position" of the temperature control dial, "standard position" being defined as that setting which under no load conditions will produce an average cabinet air temperature of 38° F. at 70° F., 43° F. at 90° F., and 46° F. at 110° F. ambient.

Data to be reported for this test are:

Kwh. per 24 hours.

Per Cent operating time.

For the ice-making test, the code calls for recordings to be made with the temperature control set at the standard, and at the coldest position. Data to be reported for each test include:

(1) Time required to freeze water in each tray, indicating the material of the tray and grid.

(2) Pounds of ice per tray.

(3) Total pounds of ice per freezing.

(4) Kwh. per 24 hours.

(5) Average cabinet air temperature.

Prima Introduces New Washer, Ironer, and Refrigerator Lines

(Concluded from Page 1, Column 4)
and reduces dehydration of leafy vegetables and other moisture-containing foods.

The units have acid-resisting porcelain interiors, a Coldial control with nine temperature zones, automatic interior light, non-corrosive ice trays with one flexible tray in each model, ice tray lifter, chiller trays, Bonderized cabinets, and tall bottle space for storage of milk and ginger ale containers. Compressor has a life-time oiling system.

New Prima washers, in five wringer and two spinner models, feature the "Mid-Zone" agitator, which is said to distribute washing action evenly over the entire mass of clothes. The fins are located midway between the bottom of the tub and the water-line, near the "point of flotation."

Three top wringer models have the Prima "NeverCrush" wringer. The deluxe models will be streamlined, and available in an all-white finish.

A standard line, slightly lower in price, also will be streamlined, and will be made in a newly developed bisque color. Third range of models will be finished in tan and green.

Prima ironers, also available in all-white finish, are said to be unusually easy to operate, without instruction or practice, due to their simplicity of construction. Number of moving parts has been reduced to five.

Pratt Offers Suggested Prices for Used Refrigerators in Outlining Trade-in Plan

(Concluded from Page 1, Column 3)
first dealer asking for a bid. Later, if another dealer is working on the same prospect, the California Refrigerator Co. is very careful to quote the same price on this same used refrigerator, never naming the previous dealer or dealers who had been interested, but stating that the same bid had been made on this particular machine to one or more dealers. Most of the dealers and distributors in the state maintain confidence in the efficacy of this idea after four years of the above plan of operation.

After the California Refrigerator Co. purchases these machines, they are reconditioned in the repair shop, where other refrigerator repair work is done at the wholesale prices for bona fide dealers and service-men only.

New parts, if necessary, are added, and from \$10 to \$30 is spent on rebuilding the old refrigerator. It is repainted, if necessary, shelves retined, etc. Then the machine is sold by the California Refrigerator Co. at a reasonable price—no cut prices are quoted or advertised in the papers. No misrepresentations as to age, size, or condition are made.

Many dealers fix up and sell their "trade-ins" at a profit, and do not

bers Association might be induced to handle this work in each territory.

What happens when a non-user of mechanical refrigeration buys a used machine? Soon he sees the great value of refrigeration and is then a potential customer for a more up-to-date refrigerator.

Generally he then buys the best refrigerator obtainable and every accessory that goes with it. His old refrigerator passes on to another future buyer of a new refrigerator. This is the experience of the automobile industry.

Many used refrigerators, after being reconditioned, go into summer homes at the seashore or in the mountains, replacing ice boxes. Many times farmers buy used mechanical refrigerators, later changing to a new one.

A schedule of prices is suggested herewith. If these figures do not meet conditions in your community, it may be necessary to raise or lower part or all of them.

On this suggested price schedule, raise the price 10% on well-advertised makes like Frigidaire and Kelvinator. Raise General Electric prices 15%, on account of original prices being higher.

Suggested Prices to be Paid for Used Mechanical Refrigerators:

Mechanical Refrigerator Trade-in Allowances

Size	2 Years Old or Younger	3 to 5 Years Old	Over 5 Years Old
2 cu. ft.	\$15.00 to \$20.00		
4 to 5 cu. ft.	20.00 to 30.00	\$15.00 to \$20.00	\$10.00 to \$15.00
6 to 7 cu. ft.	22.50 to 32.50	16.00 to 30.00	10.00 to 15.00
9 to 12 cu. ft.	30.00 to 37.50	20.00 to 30.00	10.00 to 20.00

move them through the California Refrigerator Co., although our company will go to the expense of bidding a prospective "trade-in" whether or not the dealer plans to sell it himself, or sell it through our company. Our chief function is to establish the value on any given box.

The plan works successfully only if the "Arbitrator" is absolutely honest and fair with each and every dealer, favoring no particular one or group.

If a firm similar to the California Refrigerator Co. is not available in your district, then an association may pay an outsider for his time in connection with a similar activity.

Of course, the dealers will have to cooperate in an honest way, too. This plan is worth trying even if all the dealers do not adhere to it. A 75% or 95% plan is better than no organized plan.

Last year there were about 260,000 "trade-in" deals, or 11½% of the total number of household refrigerators sold. At least 150,000 additional sales of new refrigerators were made because dealers were able to take in old mechanical refrigerators. In 1937 there should be 500,000, or double last year's "trade-ins." Therefore, it is important that our industry organize for the proper and most ethical way of purchasing, reconditioning, and selling used refrigerators.

Perhaps all or part of the 80 parts jobbers who are members of the National Refrigeration Supply Job-

Pay lower price if cabinet is badly scarred or needs paint, is not porcelain inside, or if gas has leaked out. Pay higher price if refrigerator is in good shape inside and out, if freezing is OK, and if the machine is not very noisy. All ice-cube trays and defrosting dish must be in fairly perfect shape.

Suggested Prices to be Paid for Used Ice Boxes:

Ice Box Trade-ins

25 lb. capacity—any age.....	\$2.50
50 lb. capacity—any age.....	3.50
100 lb. capacity—2 or more years old	5.00

(None of above to be removed from home or place of business for re-sale or to be destroyed.)

On new types of ice boxes sold within the last two years, especially those promoted by the ice companies, pay from \$5 to \$10. These may be removed and resold.

Victor Baxter Dies Unexpectedly

JAMAICA, L. I., N. Y.—Victor Baxter, for several years assistant retail sales manager with Rex Cole, Inc., of Long Island City, dropped dead at his home here April 8. He was 44 years old.

Mr. Baxter had been connected with the Rex Cole organization since February, 1928, when he began work with the G-E distributor as a retail salesman.



America's No. 1 Domestic Refrigerator Insulation is BALSAM-WOOL

If you are looking for a domestic refrigerator insulation that will give complete satisfaction, choose Balsam-Wool Fibre Slabs. They are used in 16 of 29 nationally known refrigerators. Millions of Balsam-Wool insulated refrigerators have proved themselves in actual use.

Such overwhelming preference, of course, is by no means an accident. Balsam-Wool Fibre Slabs have definite characteristics which place them head and shoulders above the crowd. Efficient—sealed against moisture—non-settling and clean, they meet every requirement for modern, domestic refrigeration. What's more, they reduce overhead for the manufacturer, because he can make them to his own specifications on licensed machines in his own plant. You will find it worth your while to have complete information about Balsam-Wool Fibre Slabs. Write us for it!

WOOD CONVERSION COMPANY

Refrigeration Sales Division • 360 N. Michigan Ave., Chicago, Ill.

St. Paul, Minn. • New York, N. Y.

BALSAM-WOOL
FIBRE SLABS
PRODUCT OF WEYERHAEUSER

Wherever you turn, you see

WEATHERHEAD

Refrigeration Parts

Send your specifications for special parts made to order.

★

THE WEATHERHEAD CO.
CLEVELAND, OHIO

See Pages 4, 6, 8, 10, 13, 15, 18

THE ONLY REFRIGERATOR WITH OIL COOLING

NEW **Triple-Thrift** REFRIGERATORS

1 save on PRICE! 2 save on CURRENT! 3 save on UPKEEP!



From the "House of Magic"
G-E THRIFT UNIT
WITH OIL COOLING

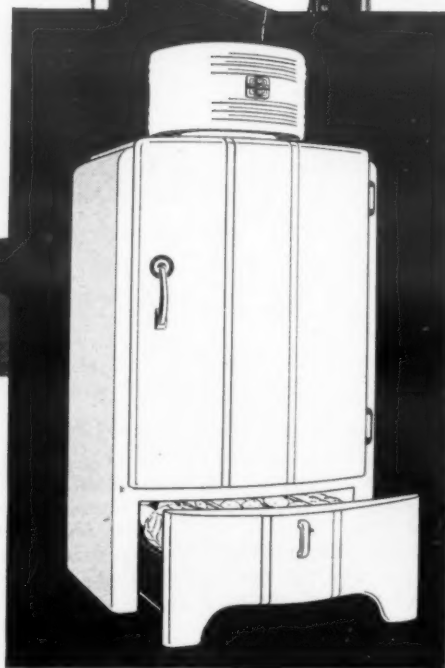
The original sealed-in-steel refrigerator mechanism—basically unchanged but constantly improved.

Backed by more years of proof and more manufacturing experience than any other sealed unit.

Forced-feed lubrication and oil cooling are exclusive General Electric features that assure longer life and low operating cost year after year.

Sealed-in-Steel Thrift Unit in All Models

5 Years Performance Protection



15 Beautiful New G-E Models at **NEW LOW PRICES**

Big, roomy, brilliantly styled cabinets—have every advanced feature for convenience and economy. Faster freezing speeds—easy-out ice cube trays—exclusive stainless steel super-freezer—full width sliding shelves—thermometer—temperature control—interior light—food containers.

GENERAL ELECTRIC

G-E offers the value sensation of the year. This preferred refrigerator that always cost less to own, now costs less than ever to buy—and America is buying them at the rate of one-a-minute.

Start a Parade of Profits!

Every refrigerator buyer is a preferred prospect for other electrical appliances and the General Electric dealer has a complete line. He can offer everything from an electric clock to a complete electric kitchen or laundry and enjoys a profitable business the year 'round. Backed by traditional quality, the famous G-E monogram is the greatest asset in electrical appliance merchandising. General Electric Company, Section DF-4, Nela Park, Cleveland, Ohio.

★ ★ ★

Refrigerators, Ranges, Dishwashers, Garbage Disposals, Complete Electric Sinks, Unit Kitchens, Washing Machines, Ironers, Vacuum Cleaners, and a complete line of Water Coolers, Beverage Coolers and Commercial Refrigeration equipment for every purpose.



Return to Basic Story of Food Preservation, Economy Will Enable Electric Refrigeration To Dominate Ice & Gas Rivals, Brown Says

By A. A. Brown,* Oklahoma Gas & Electric Co.,
Chairman, Edison Refrigeration Sub-Committee,
Edison Electric Institute

THE electric refrigerator was one of the few manufactured articles which enjoyed an increasing volume of sales straight through the depression.

It occurs to me, however, that possibly we have grown a little too sure of ourselves, and, because of our wonderful record, we may be overlooking some opportunities. While we are boasting that more than 2,000,000 electric refrigerators were placed on utility companies' lines during the past year—an increase of approximately 33% over the previous year—may I remind you that at the same time our competitors also were doing a good job.

The ice industry reports an increase of 20% in its domestic sales over the previous year; and the ice refrigerator people, also, enjoyed an increase of 35% through ice companies. Now, if we were doing the job we should be doing, certainly there would not be room for an increase in the sale of ice, to say nothing of the sales made by our gas competitors.

Of course, every one of those 2,000,000 electric refrigerators represented a great deal of sales effort, advertising, and sales promotion, and probably the traffic would not stand a greater expenditure.

Yet, on the other hand, I feel certain that if this sales effort, advertising, and sales promotion had been coordinated, even in a small degree, our competitors would not have had so much to brag about, and our own situation would have been much healthier and our volume greater.

May I remind you that because of increased efficiency and lower rates, these 2,000,000 refrigerators represented no more revenue to the utilities than the one million sold in 1931. We should, also, remember that a certain percentage of the refrigerators now being sold replace old electric refrigerators and, inasmuch as the new refrigerators consume about one-half the amount of current the old ones did, it becomes necessary to sell a refrigerator to a new customer for each replacement refrigerator sold if we are to maintain present revenues.

FIRST CAMPAIGN BEST

The electric refrigeration campaign which was conducted the first three years of the depression, under the leadership of Mr. Davidson and the sponsorship of Edison Electric Institute, is an outstanding example of what can be accomplished by coordinated activity.

You will all recall that all manufacturers, dealers, and utilities were selling electric refrigeration based entirely upon the appeal of food preservation. You all remember that the advertising carried a facsimile of a thermometer showing 50° as the danger line. You will, also, remember the slogan, "Invest in an Electric Refrigerator."

The simple fact that every one was telling the same story, and that that story had a sound appeal, was the thing that sold refrigerators in increasing numbers, even as the depression grew worse and worse, and laid the foundation for the large volume of refrigerator sales we are now enjoying.

This program accomplished what we set out to do, that is, to make the public electric refrigerator conscious. After the three-year period had expired, it was felt that the industry was well enough established to go it alone.

Since that time each manufac-

*Address delivered at fourth annual E. E. I. Merchandising Clinic, Chicago.

turer, dealer, and utility company, which sells refrigerators, sells in his own way. Business has become highly competitive; manufacturers vie with each other to bring out and advertise some new gadgets, or if their engineers can not think up enough new gadgets, new forms of guarantees are stressed.

Now it is only natural that a salesman, in attempting to sell any nationally advertised article, repeats almost verbatim the copy contained in his company's national advertising. The net result has been attempting to sell gadgets and guarantees instead of electric refrigeration.

KNOCKING RAISES DOUBTS

Perhaps this has not occurred in your property, but it has in ours. Customers have purchased electric refrigerators and then have called up our Home Service Department and asked if the particular refrigerator they purchased was any good.

When our home service representative inquired why they asked such a question, the answer was that salesmen attempting to sell other refrigerators had knocked the refrigerator they had purchased. Is it any wonder then that the gas and ice people have found it rather easy going?

The average prospect probably is approached by a dozen salesmen and listens to a dozen different stories. Each one tries to out-do the other in the matter of gadgets, guarantees and terms; scarcely a single one says anything about food preservation or what electric refrigerators will really do for her in the matter of economy.

Is it any wonder, then, that a smart salesman, selling ice or gas refrigerators, has only to talk about refrigeration and to say "yes" to all of this competitive knocking in order to make a sale?

Contrast this with the tactics used by the automobile salesmen. We all know that this is the most highly competitive business in the world. Yet, it has happened to you, as it has to me, that after shopping around and seeing several automobiles I finally decide on the one I wish to purchase.

The next day an automobile salesman calls up and tries to close the sale; I tell him I purchased my new car yesterday. Instantly he asks what kind of a car I bought. No matter what car it is, he always says, "Fine, that's good; I think that next to the car I am selling, you made the best buy on the market."

REPETITION AS A CONVINCER

Now we are all human enough to like to have our judgment confirmed. Is any wonder that the woman who has saved her money and finally purchased an electric refrigerator feels hurt when some salesman selling a competitive make tells her she bought the worst one on the market?

As sales executives, you all know that nothing is as convincing as repetition. Now, if we can get all of the electric refrigerator salesmen to tell the same story, there is no doubt about our ability to increase greatly the sale of refrigerators.

Naturally, the question comes up: "What is the story?" At the present time I can think of nothing better than the plan that was used so successfully during the first three years of the depression, that is, FOOD PRESERVATION. That story is just as good today as it was then. We have the same food, the same bacteria, and furthermore, we know

it will work because it has been tried and it did the job.

Earlier in my talk I mentioned the competition we are receiving from the ice companies. This is competition which has slipped up on us largely because of over-confidence on our part.

We thought the ice business was on its way out as a factor in refrigeration, and yet, as I have stated, they showed an increase of 20% in domestic sales and an increase of 35% in sales of refrigerators through ice companies. True, part of this is due to better economic conditions; nevertheless, this industry is far from being a dead one.

With the gas refrigerator, our only competition is with one manufacturer; however, this particular manufacturer is very aggressive. Their appeal has been: silence, no service, and low cost.

Nowhere in their advertising or sales arguments do they stress the matter of food preservation. They are coasting along on the work done by this industry, because the public takes it for granted that all mechanical refrigerators will maintain temperatures below 50°F.

For the past several years in our property we have consistently advertised "cool kitchens" in connection with electric refrigeration, and we find this the most effective weapon with which to combat this type of competition.

The advertising policies they have pursued have not been ethical. Their general tactics have been to publish a full-page advertisement designed to make dealers of electric refrigeration angry and to get them to commit the error of coming back with a nastier advertisement.

'DOG FIGHTS' COSTLY

This is usually the beginning of a dog fight, which is very costly, and, as in all dog fights, public sympathy is with the underdog. It serves to direct attention to their product, which is little known and has relatively small acceptance.

Last year when the first advertisement of this kind appeared in our local papers, a meeting of all electric refrigerator distributors was called and after several hours of arguments we decided not to answer the advertisement; but the matter was taken up with the Better Business Bureau and with the newspapers, with the result that the newspapers refused to publish further copy of this kind.

Refrigerator distributors and dealers in our territory concentrated on selling electric refrigeration and, to as great an extent as possible, to sell food preservation, although I must admit more effort was made to sell gadgets, guarantees, and terms.

We are all agreed on this: that it is good salesmanship and good business for everyone in the industry to be telling the same story, provided that story is constructive, and we know by experience that the story of food preservation is constructive and it has accomplished a great deal. Then is it not up to us to provide ways and means in which this story can be told by every one?

Naturally, without a close tie-in with the manufacturers, we can not expect to influence their advertising policies to any extent. It does lie within the province of the utility companies, however, to handle their own local situation.

Electric Refrigeration Bureaus, which have been dormant for a number of years, can be revived; another excellent avenue of approach is through the Kitchen Modernizing Bureaus which are being formed. In fact, any organization where the power company can get together with electric refrigerator distributors and dealers and sell them on the idea of not only advertising but of making their salesmen actually sell the story of food preservation, is the solution.

I am certain that we can accomplish our end. This can be accomplished by companies which are engaged in merchandising activities, as well as by those not engaged in merchandising activities.

May I cite as an example the operation in Kansas City, Mo.

A radio and refrigeration dealer association had been in existence for several years, but without strong leadership. This year the Kansas City Power & Light Co. assumed leadership, but in order to do this they had to offer them something tangible, because they were competing with them. They, therefore, made a meter reader survey, obtained and compiled a list of all their customers not now using electric refrigeration.

They tied this in with a financing plan whereby the company will bill

and collect the payments to be made. The Association employed a nationally known sales counselor to instruct their salesmen.

All salesmen who attend a given number of classes and are qualified receive a certain number of these prospect names each week, but only just as long as they conduct themselves as salesmen should and do not violate any of the rules set up by the Association as to trade-ins, discounts, etc.

It is easy to visualize, with a setup like this, that all salesmen could be trained to tell the same constructive story about food preservation. If that were done, just the consistency of it and the repetition of this story would produce a tremendous amount of business.

Seattle Municipal Utility Sales Show Big Gain in 1936

SEATTLE—The City of Seattle Department of Lighting, municipal utility company, sold \$551,637.87 worth of electric appliances to Seattle residents during 1936, compared to \$376,497.13 in 1935.

Modern to Handle Electrolux In Colorado Territory

GREELEY, Colo.—Modern Appliance Co. has been appointed Electrolux distributor in the Colorado area north of Denver, covering 17 dealers. Partners in the company are S. F. Bales, M. T. Casey, and Ray B. Fanning. A trailer display unit operates out of the Greeley store.

Columbus Graybar Leases & Remodels New Quarters

COLUMBUS, Ohio—Graybar Electric Co.'s local branch has been moved to a newly leased building at the southwest corner of Third and Chestnut streets. More than \$30,000 was spent in remodeling the building and installing new elevators and equipment.

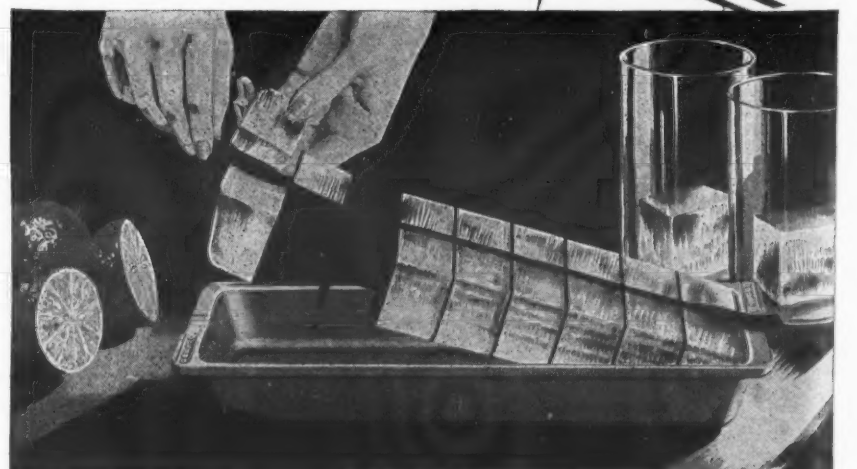
Valley Hardware Co. Opens Norge Dealership

DERBY, Conn.—The Valley Hardware Co., 60 Elizabeth St., has opened a Norge appliance dealership, handling refrigerators, washing machines and ironers.



OUT IN A FLASH!

This magic finish Presto Tray of patented* contour slips out of the freezing compartment in a flash... does not stick... has no sharp edges... just split second release of tray and cubes.



Ice Cubes Instantly

A slight pressure and Presto Tray's patented contour pops out a rubber gridful of ice cubes... ready for use... one or a dozen... as you need them... no splashing or sink dunking, no fuss or bother.

Presto-Chango—Prospects Become Buyers

The 10-second magic of the Presto Tray Demonstration will turn casual prospects into interested buyers. Presto Tray dramatizes the important refrigerator sales features which your salesmen want to stress... fast freezing... full ice-making capacity... no ice waste... no crushed cubes... no fuss... no bother. So get Presto Trays and get action. Play up split second release of tray and cubes via magic finish Presto Tray with rubber grid convenience—and sign up more and faster sales. Insist that your new refrigerators come factory equipped with Presto Trays—which give all the advantages of a fast freezing metal tray, plus all the conveniences of rubber grid.

INLAND MANUFACTURING DIVISION
General Motors Corporation • Dayton, Ohio

THE
MAGIC FINISH
PATENTED CONTOUR

Presto
Tray

WITH RUBBER GRID

ICE CUBES IN 10 SECONDS

*Patent Pending

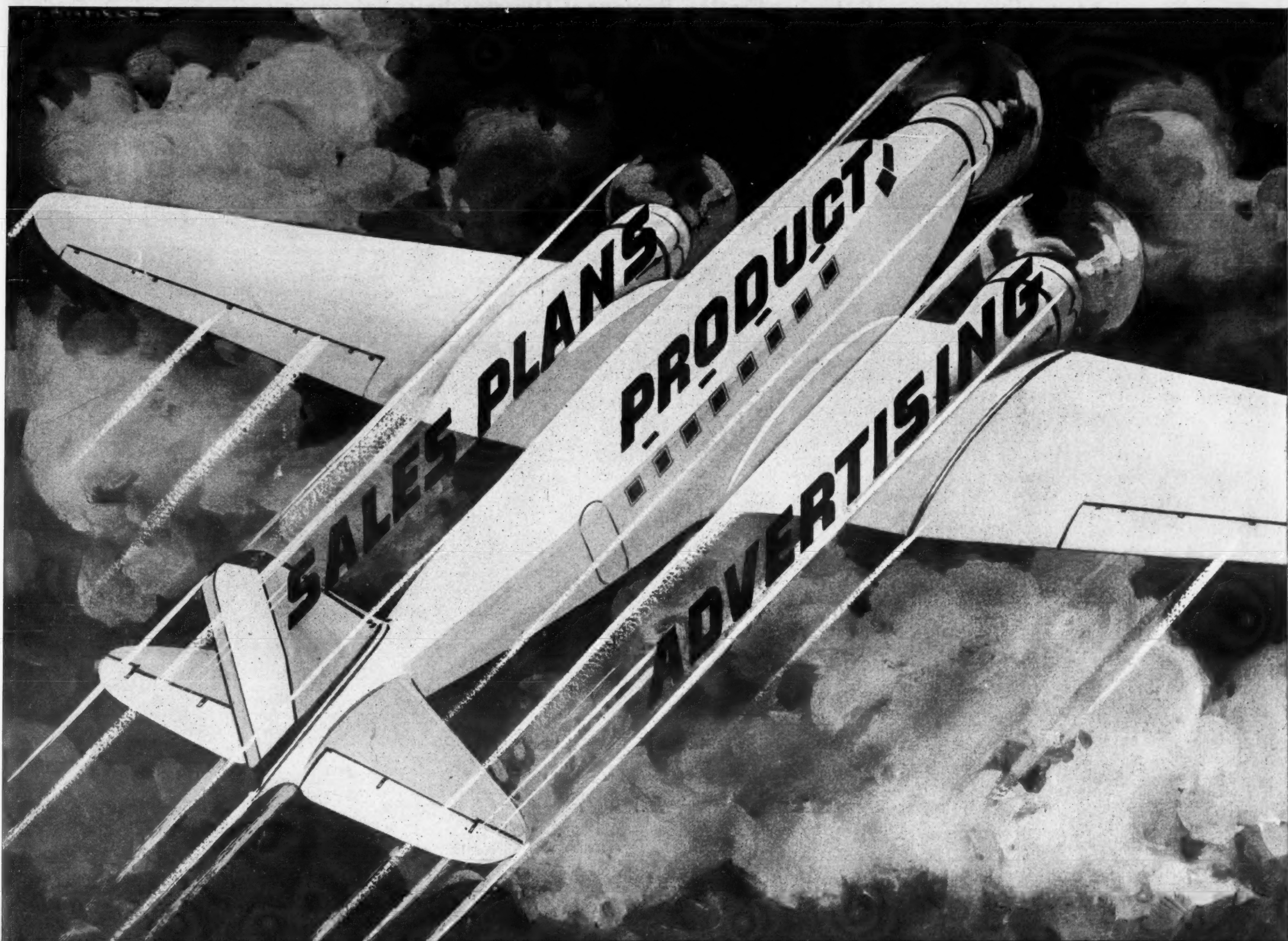
WEATHERHEAD MANIFOLDS

- Welded steel in construction for greater strength.
- Bosses full threaded to hold valves without solder.
- All parts completely tin plated.
- Made in two to ten valve units with two valve spacings.

GENUINE WEATHERHEAD REFRIGERATION PARTS

WEATHERHEAD • 300 E. 131 ST. • CLEVELAND, OHIO





1937 "TRI-POWERED" PROGRAM DRIVES FRIGIDAIRE SALES STILL HIGHER

FRIGIDAIRE DEALERS EVERYWHERE ARE AGAIN SMASHING ALL RECORDS WITH FRIGIDAIRE!

● Far above last year's great records, Frigidaire sales are climbing for all Frigidaire dealers! Not because of luck. Not because of magic. But because Frigidaire dealers are cashing in on the 1937 leadership they have in product, sales plans, and advertising!

● **LEADERSHIP IN PRODUCT!** *Unchallenged* is the new "Super-Duty" Frigidaire! With the Meter-Miser! With the patented Instant Cube-Release! With the 9-Way Adjustable Interior! With the scores of features that make it the most salable refrigerator "package" ever known.

● **LEADERSHIP IN PLANS!** *Unequalled* are the Frigidaire selling plans that crowd

dealers' showrooms with eager refrigerator buyers! All anxious to see the new "Super-Duty" Frigidaire that provides ALL 5 Basic Services for complete home refrigeration, and proves it!

● **LEADERSHIP IN ADVERTISING!** *Unsurpassed* in appeal to refrigerator buyers is Frigidaire's dramatic presentation in word and picture. Sales-compelling advertising intensified by a greatly enlarged schedule of national magazines and local newspapers.

National advertising with a *local* wallop...going direct to the largest number of families ever reached by a refrigerator manufacturer's national campaign!

FRIGIDAIRE DIVISION

General Motors Sales Corporation, Dayton, Ohio



YOU CAN DO STILL BETTER WITH FRIGIDAIRE IN '37!

The Three Main Steps to a Sale



(1) When calling at the home, the saleswoman goes to the rear door standing back about three feet when the prospect answers, says Crosley's personnel manager.

(2) After gaining entrance to the home, the saleswoman finds out the woman's name, number in the family, husband's occupation, and other es-

sential information. Meanwhile the saleswoman has been quietly figuring the monthly savings to the family through use of an electric refrigerator.

(3) If necessary, he takes the couple to the showroom for a demonstration. Details of these sales-building tactics are given in the accompanying article.

Gas Companies Open Sales Drive April 1

EVANSVILLE, Ind.—Gas companies whose combined territories are said to include 12,000,000 meters will participate in a three-month sales drive, commencing April 1, commemorating the tenth anniversary of gas refrigeration, according to H. S. Boyle, sales manager, Electrolux division, Servel, Inc.

The contest will be sponsored by the refrigeration division of American Gas Association. Eight thousand salesmen will be eligible for 2,000 awards, totaling \$35,000 to \$40,000, which will be provided by the Electrolux organization. Birthday cakes weighing 100 pounds will be given to each of 28 leading companies at the conclusion of the contest.

Utilities probably will support the drive with intensive local advertising. Servel's own advertising campaign will break this month in 19 magazines.

'More Hours for Housewife' Theme of G-E Promotion

CLEVELAND — A new consumer promotional piece on all-electric kitchens, titled "More Hours For Companionship," has just been prepared by the General Electric Co. for distribution by its dealers and by G-E home service workers.

"How much time does a woman really have? That depends, as does her youth, her charm, and her mental development, on the number of electrical servants she possesses that will transmute hours of household drudgery into leisure for other things... for real companionship with husband and children." This is the theme around which the sales story in the attractive 16-page booklet is woven.

Copy, which plays up what an all-electric kitchen will mean in terms of emancipation from drudgery, is illustrated with color photographs of four G-E kitchens.

Crosley Personnel Director Says Salesman's Actions on First Call Are All-Important

By William C. Stoner

Manager, Retail Personnel Division, Crosley Radio Corp.

Sales instruction work at the Crosley Radio Corp. is divided into two general classifications:

(1) A course that is intended to inform the salesman about the company behind the product he sells; to acquaint him with its personnel, policies, merchandise, and methods.

(2) A course that presents the technique of selling the product.

In this article we deal with the latter—the sale of a Crosley electric refrigerator by a dealer's salesman to the prospect.

Instruction starts with the fundamental matter of calling on the prospect. The proper technique of making the call is all-important in making the sale, for all that follows depends on the successful making of the first contact. No contact, no sale.

So we start out our instruction with this sentence:

"Point No. 1: In contacting the prospect at home use the rear door."

This rule we base on long experience and thousands of contacts. Fewer women by far will answer the front door than the rear.

The best time for initial home contacts is between 9 and 12:30 o'clock in the morning. During these hours the housewife will usually be found in the kitchen and rear part of the house.

We tell salesmen to pass up the bell or buzzer and use a he-man's knock with plenty of the old knuckle. By long test, we know that a real hard knock brings that housewife to the door, whereas a timid knock indicates to her that the salesman is undecided as to whether or not she will be interested. Let's get her to the door then—we can't talk to her unless we do.

The crucial point in the whole contact job comes when the housewife answers the knock. Now that he has her attention, the salesman doesn't want to fail to obtain the opportunity to present his sales talk.

Any error here is fatal. How shall he proceed? We contend the answer is quite the opposite to the methods

adopted by many would-be high-pressure salesmen.

Instead of trying to make a "forced entry" by putting his foot in the door opening (and probably into his golden sales opportunity as well), the salesman should do just the opposite: HE SHOULD STAND BACK FROM THE DOOR ABOUT THREE FEET. In so doing he assures the housewife that he is a gentleman, not a hijacker, and he gets her respect and confidence in his very first contact with her.

From experience we know that a salesman who stands too close to the door often causes the housewife to hesitate about opening the door at all. Thus we tell the salesman:

"Don't run this risk then—stand back and she'll open the door wide. You can then speak to her directly—in FULL view."

"The correct approach brings an invitation from the housewife to come in and tell your story. You can't sell them if you can't tell them. With the first battle won, you are definitely starting on the road to a sale."

"The correct approach having brought you the invitation to step in," we tell the salesman, "you now come to the point of getting that first information you must have to proceed. You want to know her name, how many are in her family, and her husband's occupation."

"You can't simply shoot a series of seven questions at her in rapid-fire manner, however. Relax a bit and say slowly, 'My name is Bowers, what is yours?' When she says 'Green' say 'Oh, Mrs. Green, I know a Mr. Green who works for the Blank Store,' to which she will be likely to reply, 'That's not my husband—he is with the Johns Mfg. Co.'"

Next, the salesman can remark that he supposes she has just sent the children along to school. Her reply indicates she has or hasn't any children.

If she has no children, a question such as, "Just you and Mr. Green live here?" will bring a "Yes" or

other information such as, "No, my sister lives with us," in which case the salesman can ask how the sister is occupied.

By this time the salesman has the family name, the number living in the home, and the number of wage earners. With this information he can judge what type refrigerator is best for the home's needs. In the meantime, he can glance around the kitchen, measuring the space most suitable for a refrigerator.

Glad of an opportunity to sit down for a few moments, as she has been busy with her morning dishes and other work, Mrs. Green tells the salesman how much ice she buys, and how much it costs, per week. He can begin putting the figures on paper, then using them to show how much money will be saved by reducing food spoilage, making fewer trips to the stores, buying in larger quantities, buying bargain specials, etc.

By her own figures he will be able to show her that an electric refrigerator will save her approximately \$10 per month. This, obviously, will take care of both the payments on the refrigerator which he will then recommend, and the necessary electricity to run it.

The paper on which these figures are placed is not to be left with the housewife. The salesman folds it and puts it into his pocket to be used in his evening call when the husband is at home.

"Put that paper away," we tell the salesman, "then as you open your album to make your sales presentation to the husband and wife in the evening, you will have these figures, given to you by the wife, to prove to the husband what an electric refrigerator will save them."

Next step (if he fails to close the sale on the evening call) is for the salesman to make an appointment for the husband and wife to come to the showroom.

Preferably he will take them to the showroom in his car. In that way he is certain of getting them to the store, and they will have no opportunity to procrastinate.

At the showroom, the salesman actually demonstrates what he has previously explained with the aid of the pictures and information in his sales manual and album. Then he completes the arrangements and terms of the sale.

The NEW Line of DIRECT CURRENT MOTORS



Illustrating 200 H. P. Direct Current Motor.

Century's new line of Direct Current Motors reflects knowledge of the requirements of continuous heavy duty applications and the designing ability to meet them.

Liberal use is made of scientifically allocated materials to produce rigid and accurate construction, exceptional commutation and remarkable freedom from vibration, all so much needed under the continuous duty of air conditioning and allied equipment and the heavy duty and shock loads of rolling mill, machine tool, industrial and processing machinery.

Built for constant and adjustable speeds... Continuous and short time duty ratings... Open, enclosed, splashproof... with covers, or screens... Sleeve or ball bearing... in sizes from 1/6 to 300 H.P. Send for new bulletins.



Exceptional Commutation Assures Long Life



CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis, Mo.
Offices and Stock Points in Principal Cities

SIZES UP TO 600 HORSE POWER

WEATHERHEAD PACKLESS VALVES

- Sturdier construction.
- Bellows Equipped.
- Available in two and three way line and angle valves.
- Sizes range from 1/4" to 3/8" in all types.

GENUINE WEATHERHEAD REFRIGERATION PARTS

WEATHERHEAD • 300 E. 131 ST. • CLEVELAND, OHIO



Sell THE ELECTRIC REFRIGERATOR THE ENTIRE NATION IS BUYING THE NEW 1937 CROSLEY SHELVADOR



**THIS MUCH MORE EXCLUSIVELY
IN THE CROSLEY SHELVADOR**

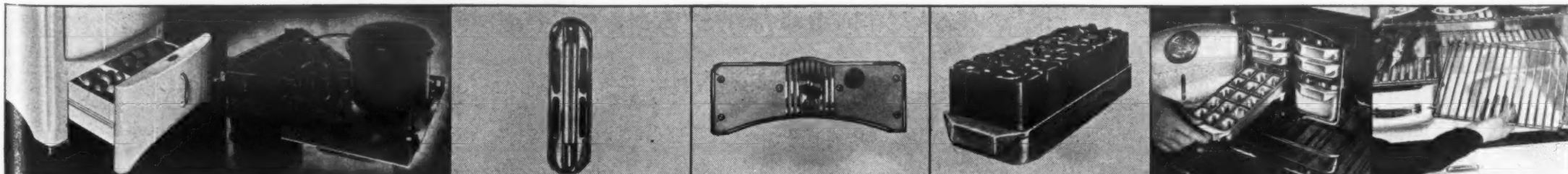
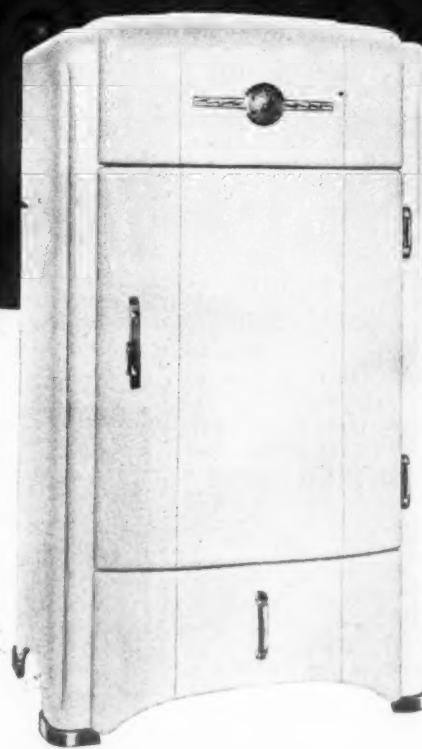


These features distinguish the Crosley **ELECTROSAVER T-5** Hermetic Unit: Non-toxic Freon refrigerant . . . economical high side float expansion system . . . high reserve capacity, resulting in short running time, fast freezing and greater ice-making capacity.

All over the country they're buying the new 1937 Crosley Shelvador *on sight!* Why? Simply because the new Shelvador offers more *visible* quality . . . more outstanding new features that the dealer can demonstrate. And Crosley Dealers are cashing in on this selling advantage. From coast to coast they're **SHOWING** these extra values of the Shelvador . . . and they're showing their heels to competition with mounting sales and profits. See your Crosley Dis-

tributor now. Let him show you how you can show the new 1937 Shelvador line to your profit.

The open and closed model shown is the DeLux HL5-71. Capacities: 7.1 net cu. ft., shelf area 16.77 sq. ft., 168 ice cubes. Features include: Shelvador, Electrosaver, 18-Point Temperature Control, Built-In Thermometer. Ten other Standard and DeLux Shelvador models available from \$99.50 up.



Storadrawer for bulky non-perishable food.

Electrosaver Hermetic Unit. High efficiency low cost operation.

Built-In Thermometer for maintaining safety zone temperature.

18-Point Temperature Control gives desired fast or slow freezing.

Red Beetleware Cups for freezing salads or desserts.

Quick-Acting Ice Tray Release for easy access to cubes.

Removable Shelf Section accommodates roasts, turkeys and other large articles.

THE CROSLEY RADIO CORPORATION - CINCINNATI • POWEL CROSLEY, Jr., President

Home of "the Nation's Station"—WLW—500,000 Watts—70 on your dial

CROSLEY SHELVADOR

- WHAT DEALERS ARE SAYING & DOING -

Finding Good Salesmen Seems Biggest Problem of Long Island Dealers

By T. T. Quinn

Rose Bases Confidence on Good Window Displays

When a dealer sets for himself a 35% increase in volume for the year, and then shows a 75% increase for the first two months of that period, he's usually pretty confident of his own ability to hit his mark—and there's always a reason.

Joseph Rose & Sons, Inc., furniture store, set that quota and made that mark for January and February. From a \$65,000 volume in 1936, the company is shooting at \$100,000 in 1937. Only Kelvinator products are handled.

Reasons for the store's confidence became apparent in a conversation with George Rose, sales promotion manager.

The company goes out for business with a double-barreled attack—attractive window displays plus an aggressive, well-trained and managed sales force, managed by Daniel A. Phelan, head of the store's appliance department. And the displays are no small part of the plan.

Sales Manager Rose does the window display planning—and works from the angle that a thing that's worth doing well is better done individually. No factory materials for him. The theme, of course—but the ingredients are store-planned.

We saw plans for the store's first Kelvinator window showpiece when we called. Using the theme, "Kelvinator Cuts the Cost of Better Living," Mr. Rose has mounted a Kelvinator on an iceberg background, with a polar bear and a penguin around to lend Arctic atmosphere to the scene.

Others during the year will be on varying subjects, with the "Cuts the Cost of Better Living" theme running throughout. Tailor-made to the store's window specifications, the displays prove effective business-getters, Mr. Rose says.

In the sales department proper, six men work the year around under Mr. Phelan's direction. Sales meetings are held regularly, and inter-organization contests keep the men going along at top pace or thereabouts most all the time.

Probably Rose's most prolific source of prospects and business, though, is the store's practice of holding cooking schools each spring and fall. These schools, managed by the store's own home economist, Eloise Budde, draw in prospects from all over the territory, and give the salesmen weeks of work on the best type of names, Mr. Rose says.

Last fall's show, held from Nov. 19 to 21, attracted thousands of housewives. Sessions were held at 2 p.m. and 8 p.m. all three days, with no charge for admission and free prizes daily.

Spring shows are the best ones at which to obtain refrigerator prospects, although the fall meetings hold hold up well in attracting that type of business, too. Best opportunity in the fall, of course, is to stir up interest in giving electrical gifts at Christmas time.

"Always Something New" is a Rose slogan applying to cooking schools, and last fall the company held a "five-minute sale" at the beginning of each session.

The sale scheme, says Mr. Rose, consists in offering a certain appliance for sale during a period of five

minutes, at a price considerably below that usually asked for—it at other times.

Coffee makers, toasters, irons, and other small appliances are usually offered—but last fall Mr. Rose devoted one "sale" period to Kelvinator refrigerators—and sold two of them during that time.

Altogether, during the show the store sold 147 electrical appliances in its "sale" periods, for a total of \$3,500. Which just about makes the cooking school pay for itself, even if no prospects are obtained from it.

And this last, Mr. Rose assured us, is most emphatically not the case. He thinks it's about as effective a bit of promotion and prospect-getting work as can be done.

Movie-Going Salesmen Bother A & A Co.

Handling Hotpoint and Stewart-Warner refrigerators, and Westinghouse, Hotpoint, and Estate electric ranges, A. & A. Electric Appliance Co. has found early spring business dull in all except the service department, according to George T. Lilley, co-proprietor.

New with Stewart-Warner, the company had sold none of this make and but four Hotpoint units at the time we were in there. Service men, however, kept coming in and out of the place all the while, reporting the results of "trouble-shooting" calls and leaving right away on others.

Owners in the territory, it appeared, were getting their refrigerators readied up for the spring and summer heavy duty period. Some of them had been putting up with minor "bugs" during cold weather, but wanted everything set aright before the warm months came.

While sales appeared slow at the time, Mr. Lilley was not inclined to worry over this year's business prospects. Things, he said, would be picking up after a bit.

"We'll sell plenty," he said, "if we can get some good salesmen."

The store has only one salesman working now, but will work any number of good men once the selling season proper gets under way. And the "any number of good men" is the sticker—for Mr. Lilley says they're mighty hard to find.

"Too many salesmen," he opined, "are afraid they'll make some money in this business, I guess. At least most of the ones we get are that way."

"They'll sell one unit a week, and spend the rest of the time going to movies. Seems like they just don't care about making any real money selling—all they want is just enough to get along with."

Commission rate offered by the company is a flat 10%, with no advances, no drawing account. This last was tried some years ago, but Mr. Lilley said it worked out all to the bad.

"The conscientious men, when they got into a hole with us, thought they ought to stick around and work themselves out—that got them in deeper than ever, most times. The ones who didn't give a darn just ran out on us—so it worked out bad from both angles and we finally gave it up."

Electric range sales are still slow, despite efforts of the utility company (New York & Queens Electric Light & Power Co.) to promote use of the appliance through a vigorous rental range campaign, Mr. Lilley said. He's sold one range so far this year.

There are a good many trade-ins for electric refrigerators in his territory, Mr. Lilley said, but they don't bother him a lot, because he can play them from two angles.

"If the refrigerator we trade for is more than five or six years old, we don't even monkey with it. We just tear it down and sell the parts for replacement on refrigerators we do service work on."

"But, when the box is fairly new, we naturally repair it and sell it to those of our prospects who are in the market for bargains, and who don't want to pay the price of a brand new unit."

"Either way, we come out all right."

Mr. Lilley has no complaint against the new models—he thinks they're swell—except for one thing. They're too wide.

Working in a district in which apartment houses are plentiful, the company finds many opportunities for volume business in the replacement of obsolete refrigeration systems for whole buildings at a time.

Current problem involved the sale of some 40 refrigerators of about 4 cu. ft. capacity, and Mr. Lilley had the inside track—but neither of his two makes would fit into the space occupied by the old ones. The original units, it seems, had been set into wall niches, and replacements had to fit in there, too, or part of the wall would have to be torn out to make room for them.

This the owner was not disposed to do—and so Mr. Lilley is looking for narrower units (somewhere around 21 inches, as we recall) to swing this job for him.

"Missing 40 sales by a couple of inches is hard to take," he says.

Chain Relies on Advertising To Bring in Customers

Our one excursion into the Long Island City chain appliance store field wasn't over-productive of information, although Manager Bergman of Vim Electric Co., at which we called, was pleasant and courteous.

Business this year, Mr. Bergman said, hadn't started yet. Last year's business was good, but still not as good as it had been in 1935.

The store operates no outside selling crew. All sales work is done inside the store, by Vim's crew of all-appliance salesmen.

"Vim operates 28 stores in the New York area," Mr. Bergman said, "and none of them does outside selling. We are large newspaper advertisers, and figure that if our advertising doesn't pull prospects in, outside selling work won't help much."

The Long Island City store was showing Westinghouse, Sparton, Crosley, and Frigidaire.

Loscalzo Starts First Year With Aggressive Crew

Joseph L. Loscalzo, who managed Rex Cole, Inc.'s Long Island City store, had just taken over the business as an independent enterprise under the new plan under which Cole withdrew from the retail field, and was holding his first sales meeting at the time we called.

An aggressive, pleasant young man whose experience under the Cole banner had evidently taught him what the appliance business was all about, Mr. Loscalzo, we found, had plenty of ideas but little time to talk about them.

As we watched, 15 salesmen trooped through the small showroom, where General Electric appliances of every kind are displayed, and into a conference room behind. These, Mr. Loscalzo told us, were his whole sales force, experienced men whose efforts he expected to net him a good profit during his first season "on his own."

"Good salesmen are scarce," he said. "All of my men are real producers—they have to be, or we couldn't afford to keep them on. But I'll still guarantee a good income to as many more good producers as I can get."

Starting March 1, Mr. Loscalzo planned to put into effect a floor plan for salesmen which he believed would result in more aggressive outside selling work.

Salesmen, it seems, like floor work—where prospects come in to inspect appliances, compare prices, and are fair game for a bang-up product demonstration.

Mr. Loscalzo plans to put floor days at a premium by allowing that privilege only to salesmen who have hit 75% or better of their established quota for the previous week. Inside sales work will then be a reward for effective effort in the field—and only the best men will be on hand when the prospect calls, insuring better demonstrations, more effective closes, and—he hopes—increased floor sales.

Of course, there's a chance that eventually the floor days may be monopolized by a few crackjack men—but Mr. Loscalzo doesn't consider that too likely.

New men will repeatedly be breaking into the "select circle," he believes, and the competition among middle-bracket men for two or three floor spots should spice things up all along the line.

Inauguration of the floor plan will make no change in the store's regular routine, however. At present, this calls for daily reports by salesmen, either in person or by telephone. Mr. Loscalzo wants to be certain that all his men are on the job. Two or three failures to report puts a man on the questionable list, from which deletion is considerably slower than addition.

Electric range sales have been slow, Mr. Loscalzo says. He'd like to sell a raft of them—and keeps his men on their toes for any signs of business—but the acceptance period just isn't here as yet, he says.

People in moderate circumstances think nothing of buying an electric refrigerator—it's a necessity, something they've found they need in their

(Concluded on Page 9, Column 1)

A recent survey showed that 80% of all electric appliances are sold by specialty appliance dealers, utilities and small retailers. These are the merchandisers who can and do sell the higher-priced units.

On refrigerators, porcelain enamel throughout is a very real selling point for the fellows who are responsible for the bulk of your sales.



PORCELAIN ENAMEL INSTITUTE, INC.
612 North Michigan Avenue, Chicago



40% more efficient in keeping fresh vegetables — FRESH

—a demonstrable fact that will turn hard-to-close prospects into customers.

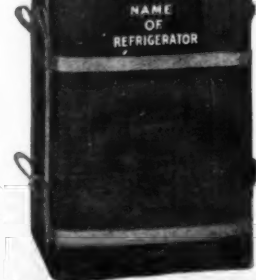
The
JEWETT
3 COMPARTMENT
3 TEMPERATURE
REFRIGERATOR

Established 1849
THE JEWETT REFRIGERATOR CO., INC., BUFFALO, N. Y.

The new Jewett refrigerator has everything it takes to get the business on a competitive basis—every worthwhile feature that the public wants. And in addition it features the exclusive Jewett Humidifier Compartment which reduces vegetable shrinkage, by weight, more than 40%. You'll need the Jewett Refrigerator exclusive franchise to get the most profit in today's highly competitive market. Write or wire today.

THE MASTERCRAFT ADJUSTABLE PAD AND CARRYING HARNESS FOR SAFE DELIVERY OF AUTOMATIC REFRIGERATORS

Pad and harness ADJUSTABLE to many sizes and styles of cabinets. Economical—Efficient. Sturdily constructed, easily applied. Name of refrigerator attractively lettered on pad without charge.

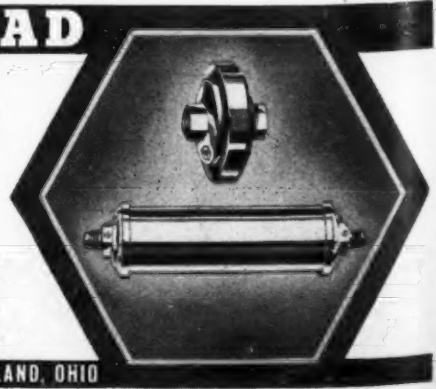


Pad (Adjustable) \$9.50 ea.
Harness (Adjustable) \$6.00 ea.

The Pad and Harness are separate.
Individual carrying straps \$1.75 each and up. Write for 1937 Folder & Prices on entire Pad Line.

BEARSE MANUFACTURING CO.
3815-3825 Cortland Street, Chicago, Illinois

WEATHERHEAD
DEHYDRATORS for drying
SCALE TRAPS for catching
FILTERS for straining
GENUINE WEATHERHEAD REFRIGERATION PARTS
WEATHERHEAD • 300 E. 131 ST. • CLEVELAND, OHIO



Long Island Dealers Foresee Good 1937

(Concluded from Page 8, Column 5) everyday living. But a range—that's something else. It's a luxury . . . something they'd like to have later, "when we can afford it," but not now.

And you have to tap the moderate-income market before you can expect volume sales, Mr. Loscalzo believes. Electric refrigerators had to wait for it . . . and so will ranges.

Eisenberg Pays All Salesmen Salary Plus Commission

Owner Julius Eisenberg of the specialty store bearing his name says good salesmen are hard to find. He should know—for he offers just about the most attractive financial inducement of any dealer in the Long Island City territory.

"Our practice here has been to pay salesmen a salary of \$25 a week, plus a commission of 5% on all major appliance sales," he told us. "A salesman, the way we look at it, has to maintain a decent appearance at all times, if he's to get an audience on which to try his talents."

"Even the best men sometimes run into periods of a week or more in which business is absolutely dead. Nothing they do turns out right. Every prospect wants to wait until later."

"Without an income, many of these salesmen fall off, lose their grip. But even so small a salary as \$25 a week, we find, keeps them going along, with enough cash coming to take care of ordinary needs."

"We like the salary idea better than a drawing account, because everything's square between store and salesman at all times. He doesn't owe us anything as a result of drawing advance commissions during sale-less weeks—and we're free to terminate his employment whenever we wish."

Use of such a system, however, requires rather close supervision of salesmen's work, to see that they're not just drawing their weekly pay and doing nothing more about bringing in business. Eisenberg's men make regular reports of their daily doings, and these are checked against selling results.

Mr. Eisenberg had just returned from a winter vacation in South America when we called. He was tanned and fit, looking forward to a fine 1937 after a more than average 1936, as far as refrigerator business was concerned.

The store, which employs six salesmen when the selling season is on in earnest, has its appliance department housed in the basement. Norge, Kelvinator, and Westinghouse are the refrigerator lines handled. Drawing attention to the downstairs display is a Norge matched color kitchen unit at the head of the stairway on the main floor.

Although he sold 15 electric ranges last year, Mr. Eisenberg does not believe that this appliance will ever have the degree of acceptance which the electric refrigerator has attained.

"Electric ranges are too hard to sell," are his words.

"To sell electric ranges, and make them stick, you've got to teach the housewife to cook all over again—without worrying about the oven, or monkeying with other gadgets until the meal is finished."

"And you just can't keep the housewife from peeking, to see how the meal is coming along."

"Besides, electric rates around here are too high right now—and they'll have to be lowered considerably before anything like a successful range drive can be carried on."

Griffith to Handle Horton

DAYTON—Griffith Distributing Co., local Grunow distributor, has taken on distribution of Horton washers and ironers for this territory.

Sales Manager or Distributor for Washington, D. C.

Due to absorption of Washington's oldest, largest electrical house by national manufacturer and discontinuance direct sales activities, manager seeks new connection for Washington sales. His special qualification is ability to organize specialty sales on profitable basis and to secure large volume business. In 14 years as manager has made profit each year; total sales about \$11,500,000; sales past two years over a million each year on varied line including electric refrigeration both domestic and commercial, ranges, air conditioning and oil heating. Commission or equivalent basis preferred. Will consider good distributorship. Age 39. Graduate engineer. Address C. L. McCrea, 3300 Cathedral Ave., Washington, D. C.

Herron Feels Denver Trade-in Problem to Be Temporary; Careful Checking Necessary, Garbarino Declares

DENVER — Establishment among local refrigerator dealers of a rigid retail code setting up, among other things, a schedule of maximum trade-in allowances, has given rise to many comments from all types of dealers here on the trade-in and replacement problem.

"Trade-in customers are demanding too much for their boxes," declares G. A. Herron, buyer for May Co., local department store. "The big problem seems to be that of convincing the public that recent mechanical advances plus natural depreciation have cut the market value of out-of-date units to a mere fraction of their original cost."

"We have always been careful about accepting trade-ins," he continues, "and we intend to maintain this rigid policy."

Mr. Herron also believes the current replacement problem is not permanent.

"Old style refrigerators are beginning to give out en masse," he explained, "and the majority of these are being replaced immediately. The

peak of this replacement market may come within the next year. Newer models are built to last longer, and can easily and inexpensively be repaired or replaced with new or reconditioned units."

A two-point policy of more careful mechanical appraisal, both in the trade-in prospect's home and in the service shop, is the answer of Cahn-Forster Electric Co., independent dealer, to the present replacement situation, according to P. J. Garbarino, manager.

"We have found such careful checking to be absolutely necessary," Mr. Garbarino points out, "because the small net profit permitted the retailer by manufacturer and distributor leaves him no trading margin, and lengthens the odds against him in making any trade-in deal."

"We do not plan to handle any replacements," says Mr. John Macker, of Fred Davis Furniture Co. "Being a furniture store, we don't have the reconditioning and service facilities which traffic in used boxes necessitates."

Browne Heads Gibson's New York State Sales

GREENVILLE, Mich.—William J. Browne, for several years assistant sales manager of Gibson Electric Refrigerator Corp., has been placed in charge of the company's sales in the New York state territory, according to John L. Stephens, Gibson sales promotion manager.

Mr. Browne has been with the Gibson organization since he was graduated from the University of Michigan in 1931. In his new position, he will maintain headquarters in Schenectady.

Onthank Named to Executive Post with Schneiderhahn

DES MOINES—G. W. Onthank was recently elected to the board of directors, and appointed treasurer and assistant general manager of the A. A. Schneiderhahn Co., Leonard distributor here, according to A. A. Schneiderhahn, president. Mr. Onthank has been with the company since 1931.

The distributorship serves a dealer organization of more than 1,000 accounts in Iowa and western Illinois.

12 Omaha Dealers Sponsor Treasure Hunt Contest

OMAHA — Coordinating their displays by means of a contest which required participants to visit each store in their search for clues, 12 appliance dealers who recently cooperated in Omaha's first city-wide home electrical appliance show set up individual exhibits in their own showrooms, instead of grouping them in a central hall or auditorium.

A 4-cu. ft. refrigerator of any make the winner might choose headed the list of 13 prizes offered in the contest. The show was heavily promoted in the local press.

Dealers participating in the show were: Reitz Sales & Service, Frigidaire; Donahoe-Norge Appliance Co., Norge; Paramount Radio Shop, General Electric and Stewart-Warner; State Furniture Co., Kelvinator; Industrial Electric Co., G-E and Kelvinator.

Hayden's, Westinghouse and G-E; Nebraska Power Co., G-E; Maypers, Stewart-Warner; Archer Electric Co., G-E; E. B. Williams, Inc., Gibson; Allen Appliance Co., Westinghouse; Sears, Roebuck & Co., Coldspot.



WITH TWO OF THE GREATEST NATURAL SALES APPEALS SINCE THE FIRST ROLLATOR REFRIGERATOR

1- Low-Temp ROLLATOR REFRIGERATION 2- NEW Flexible INTERIOR ARRANGEMENT

Norge again sets the pace with the greatest advances in home refrigeration since the introduction of the Rollator—the new Norge LOW-TEMP Rollator Refrigerator and ingenious new flexible interior arrangement in both Low-Temp and Deluxe models.

Straight through the line—right down to the "price" models—Norge has greater value to sell, greater value to demonstrate. Norge dealers enjoy two advantages—sensational public acceptance of the name Norge and continuous product leadership.

The Norge 1937 advertising and sales promotion program is the greatest in Norge history. Get full details of the Norge proposition from your nearest Norge distributor. Liberal finance plans make it easy to be a Norge dealer.

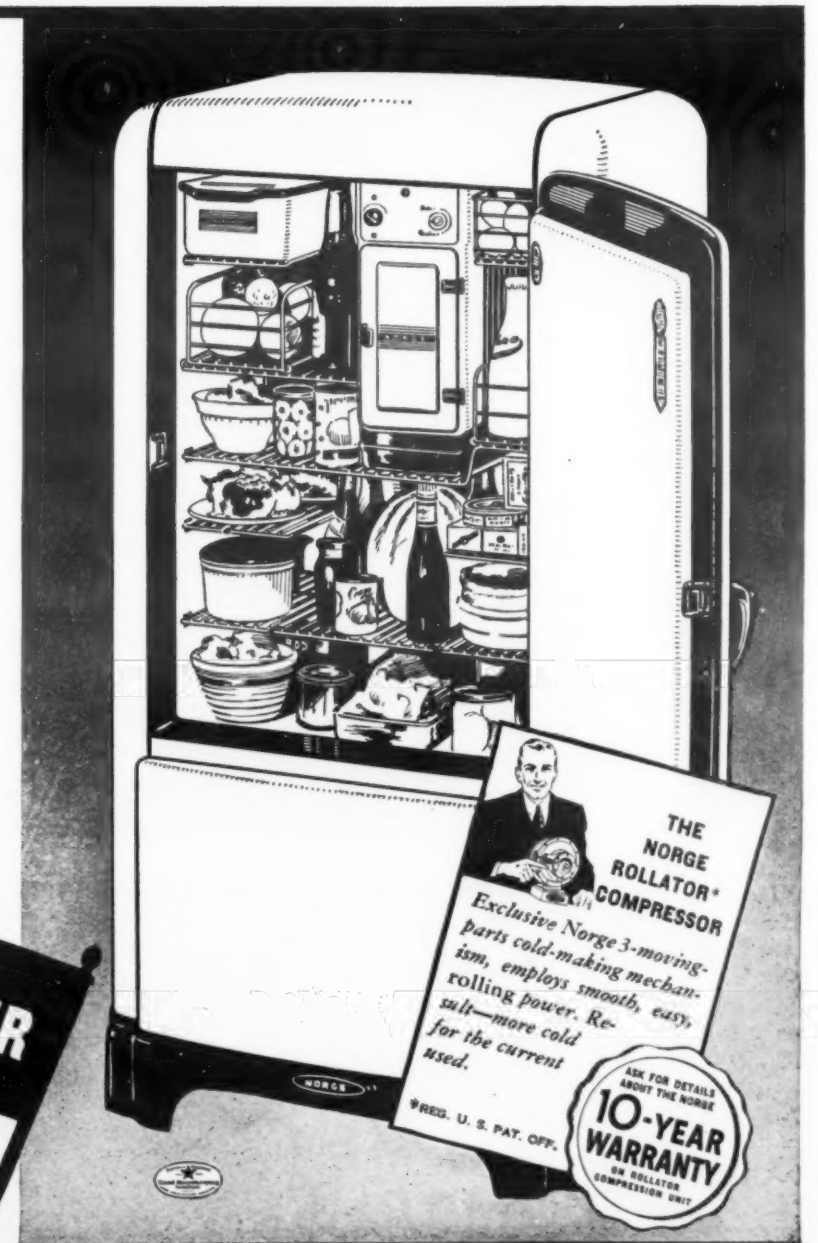
NORGE DIVISION Borg-Warner Corporation, Detroit, Michigan

See THE DIFFERENCE! Sell THE DIFFERENCE!

Pocket THE DIFFERENCE!

BE A NORGE DEALER

ROLLATOR REFRIGERATION (Domestic and Commercial) • GAS AND ELECTRIC RANGES
WASHERS AND IRONERS • WHIRLATOR OIL BURNERS • GAS BURNERS • FINE-AIR
FURNACES • COAL STOKERS • AIR CONDITIONING • CIRCULATOR ROOM HEATERS



Gaston Opens Own Appliance Store in St. Louis

ST. LOUIS—William G. Gaston, for several years associated with wholesale electrical appliance firms in this territory, has opened his own specialty store, under the name of Gaston Appliance Co. The store will handle Frigidaire refrigerators, Hotpoint ranges, Maytag washers, and Ironrite ironers.

Milwaukee Housing Project Gets 519 Hotpoint Ranges

MILWAUKEE—Delivery of 519 Hotpoint electric ranges was recently made to the Parklawn housing project here by Edison General Electric Appliance Co. The shipment was the first made by the company on its recently obtained order for 7,802 Hotpoint ranges.

Valley Electric Co. Purchases Ellensburg, Wash., Firm

ELLENSBURG, Wash. — Valley Electric Co., owned by Dick Williams, Tracy King, and K. P. Reynolds, has purchased the appliance business of Thomas & Price here, and will operate it as a separate store, handling Norge refrigerators and companion appliances, Maytag washers, Zenith radios, and other electrical goods.

Modern Showroom



The "Leonard" corner of Eisler's showroom with its "Master Dial" display and steel furniture.

leads. Eisler's employs no specialty sales "tricks," and forbids price-cutting by its salesmen.

Mr. Eisler's most recent advertising move has been to use display cards on all Public Service busses running in and out of New Brunswick to nearby towns and cities. He finds these to be potent factors in bringing in prospects who do their shopping in New Brunswick.

Paszamant Gets Results by Giving Salesmen Competition

Around the corner from Eisler's, Inc., are the showrooms of Paszamant & Co. at 5 Prospect St. where Edward Paszamant conducts a large business in the complete Carrier line of air-conditioning apparatus. The firm also maintains a showroom for Norge and Universal Cooler household refrigerators on French St.

Paszamant & Co. also handles Deisel engines, Seeger commercial equipment, oil burners, radios, washers, electric ranges, and other electrical appliances.

Mr. Paszamant has innovated an interesting system of competition among his six outside salesmen in the New Brunswick territory. The area is divided into four territories, each with its own salesman. The other two he calls "free lances," who work in all four territories against the regular representatives and each other.

"My 'free lances' have been instructed to treat their four district associates as outside competitors," said Mr. Paszamant. "In other words, they are free to work all four territories without restriction, and if they can take a sale away from one of

(Concluded on Page 11, Column 1)

— HOW SUCCESSFUL DEALERS OPERATE —

Eisler Finds Native Hungarian Music Radio Program Boosts Sales in New Brunswick; Commercial Business Best in History

By W. H. Long

NEW BRUNSWICK, N. J.—Clever use of foreign language radio programs, native holiday picnics, and advertising in a leading Hungarian newspaper to stimulate refrigerator sales among the 20,000 Hungarian residents in the New Brunswick area have been instrumental in bringing Eisler's, Inc., of this city, to a position of prominence as one of the largest appliance dealerships in central New Jersey.

Fifteen years ago, genial Andrew Eisler gave up his work as a skilled mechanic to start a small appliance business among his fellow Hungarians in New Brunswick. After several years, he took in partners to aid him in the business—these men now operate their own stores in the city—but about three years ago, the combination split and Eisler incorporated under his own name in his present large store at 123 French St.

Today Eisler is doing a major share of the refrigeration and electric appliance business in New Brunswick and several surrounding small towns such as Highland Park, Franklin Park, and the Millstones, and holds a virtual monopoly on the very profitable business among his countrymen, most of whom work in the large Johnson & Johnson, Squibb, and Zonite chemical plants in New Brunswick and nearby.

Mr. Eisler "knows his Hungarians" and how to appeal to their innate liking of a modern home with modern conveniences. Each Thursday night, Eisler's, Inc., sponsors a quarter-hour program of native Hungarian music over radio station WTNJ, Trenton. The program has its own soloist, orchestra, and announcer—all of whom are Hungarians—with all announcements in that language.

"We Hungarians love music, particularly our own," says Mr. Eisler, "and I find this program a wonderful method of bringing in customers from all over this part of the state."

The writer reminded him of Editor Taubeneck's "Around The World" stories on Budapest, of which city Mr. Eisler is a native, and found that he had read them several times.

"You can tell Mr. Taubeneck for me that he knows his Budapest," Mr. Eisler said, "and the next time he stops there I'll be glad to give him some addresses of relatives and friends."

Besides his Thursday evening program, the New Brunswick dealer employs commercial "plugs" several times each morning, using a different angle of sales appeal each time. He also uses a large amount of display advertising in New Brunswick's "Magyar Herald," which reaches Hungarian-speaking residents in many central New Jersey localities.

Eisler's holds franchises for Leonard, Crosley, Grunow, Gibson, and Universal household refrigerators, and an exclusive Kelvinator commercial franchise for New Brunswick.

Commercial refrigeration is Mr. Eisler's "pet," and he devotes his personal attention to the engineering of all installations, leaving his house-

hold refrigerator business to a corps of nine salesmen.

"Because I started life as a mechanic, I was interested in commercial installations from the time I started in the business," Mr. Eisler declared. "Right now, my commercial business is the best in the store's history, and last month it was almost too good to be true."

"My success formula for building a good commercial business is: never undersize a job, no matter if you lose the sale to a competitor," said Mr. Eisler.

"I specify to the prospect what I find to be the most desirable machine and load capacity for the installation; in other words, I study out the job first. Then, if the prospect still thinks I'm oversizing the job, I thank him for calling us in and say goodbye."

"If I think a ½-hp. machine will just carry the job and no more, I specify a ¾-hp. unit," he stated. "Today, too many people are looking for price installations—they seldom figure on an expanding business."

"That's why I stick to the principle of never undersizing. It pays dividends. And, let me tell you it certainly saves service calls."

The New Brunswick man finds

many good-sized commercial installations for Eisler's through watching the newspapers for factory, restaurant, and meat market alterations. At present, he says, many businesses are adding new equipment or repairing old, and frequently sales of new equipment can be made in these sectors.

In his household refrigeration department, he employs nine full-time salesmen, including himself, and plans to add about three saleswomen in the early summer. He believes that women prospects would rather talk to a well-informed saleswoman than to a man, no matter how handsome.

"I consider my service department the best and cheapest means I have of advertising my household business and to induce floor traffic," he declared.

"When prospects hear that an Eisler service man is always on the job and ready to repair one of our boxes at a few minutes' notice, they feel that there's something behind the company selling the refrigerator. So they often just come in to look us over."

Eisler's has the unusual record of

only two repossessions over a period of three years, according to its owner. These two, he claims, were caused by customers whose financial integrity he trusted against better judgement.

All time-payment purchases are carefully investigated before the sale is made, and no terms longer than two years are offered. Mr. Eisler says that he encourages down payments larger than those specified by his finance company, and frequently obtains them.

A surprising pick-up in cash sales has been noticeable this spring, Mr. Eisler commented.

He allows a 10% commission on household refrigerator sales to a corps of about 15 grocerymen, meat truck drivers, and bakers in New Brunswick who furnish him with

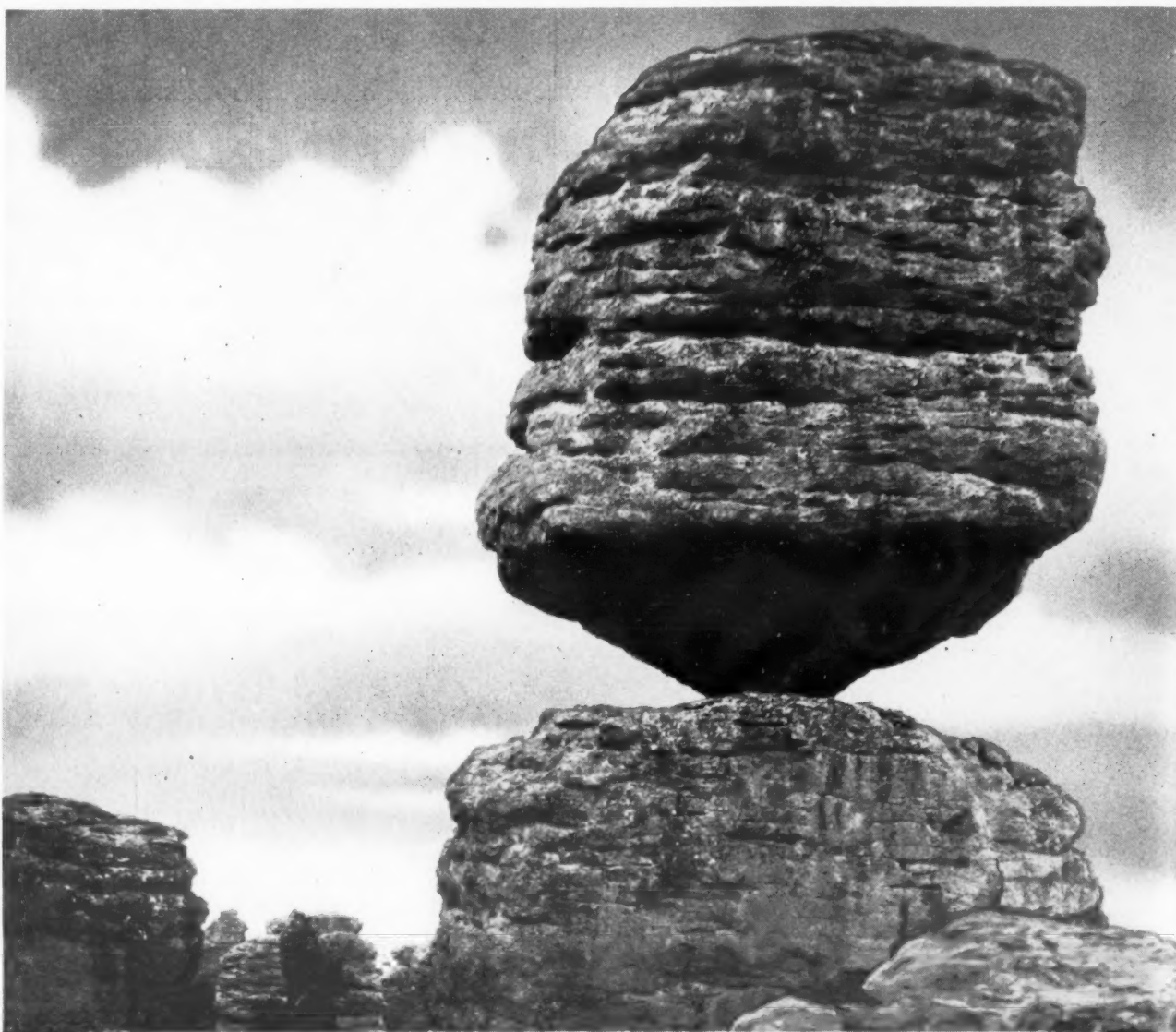
CONDENSERS
DOMESTIC EVAPORATORS
COMMERCIAL EVAPORATORS
AIR CONDITIONING SURFACE

McCORD
REFRIGERATION AND
AIR CONDITIONING
Products

BLAST HEATING SURFACE
COMFORT COOLERS
MARKET COOLERS
UNIT HEATERS

CATALOGUES ON REQUEST

McCORD RADIATOR & MFG. CO.
DETROIT, MICHIGAN



Balanced

The famous Balanced Rock in the "Wonderland of Rocks," Arizona—28 feet high; estimated weight, 50 tons.

Delco motors are both statically and dynamically balanced—all rotating parts being carefully checked for balance at all running speeds. The result is smooth, vibrationless and quiet operation throughout many years of use . . . another factor in the preference shown for Delco motors by makers of the better refrigerators, washers, ironers, stokers, oil burners and air conditioners. DELCO PRODUCTS DIVISION, General Motors Corporation, Dayton, Ohio. . . In Canada: McKinnon Industries, Ltd., St. Catharines, Ont.

DELCO MOTORS

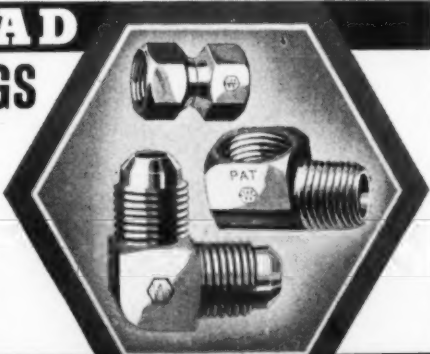


WEATHERHEAD BRASS TUBE FITTINGS

- Flat-sided, for easy, non-slip installation.
- Styled in keeping with modern trends.
- Greater density . . . greater strength.

GENUINE WEATHERHEAD REFRIGERATION PARTS

WEATHERHEAD • 300 E. 131 ST. • CLEVELAND, OHIO



'Unusual' Promotion Plans Work Well In New Brunswick

(Concluded from Page 10, Column 5) the regular salesmen, it's all to their credit and the 'regular's' discomfiture. "Thus, these six men cover an area composed of about two and one-half counties, and it's surprising to know the efficiency with which this system works. Right among my own salesmen I've developed a spirit of competition which keeps each one of them on their toes every day. Getting business is their job, and no holds are barred."

Mr. Paszaman takes great pride in his service department of five regular employees. To Mr. Eisler's statements concerning the importance of a service as a sales inducement in the New Brunswick territory, he added that as a university town it had a high degree of service expectancy, and his men were trained to answer all calls on as short notice as possible.

This firm has been doing some large air-conditioning jobs in several of the chemical plants in and around the city, and recently completed a difficult installation in the banana storage warehouse of Harry Yaches & Co. Mr. Paszaman reports that 1937 business is so good at present that a virtual doubling of 1936 figures is in prospect.

Dunn & Dunn Use Music Dept. To Build Floor Traffic

Located in Livingston Ave., one of the main business thoroughfares of New Brunswick, is Dunn & Dunn, a Kelvinator outlet which also handles several lines of radios and washers.

Here E. A. Dunn explained a method of bringing in prospects which at the same time operates as a profitable separate business from the main one of refrigerator and radio sales.

In the rear of the Dunn store is a wall practically covered with sheet music racks containing all the most recent popular hits. This is in charge of a pretty blonde sales girl. Nearby are the city's grade and high schools, and a fairly continuous stream of high school youngsters comes into Dunn & Dunn to purchase music for their pianos at home. In reaching the music department, they must pass down two aisles lined with Kelvinators.

Besides the high school element, says Mr. Dunn, many of the children's parents accompany them into the store and older individuals also form a considerable part of the sheet music trade. In this way, they pass the refrigeration "line-up" on their way in and out of the store, and the four Dunn salesmen do the rest.

One sale in the neighborhood of \$300, Mr. Dunn recalls, resulted from a mother who came into the store with her daughter to buy some music. When they were leaving—after buying a large Kelvinator—the mother said: "What was it we came in here for, Mabel—?" and named a popular song hit of the day.

Mr. Dunn explained that his service department often continued service on a box after the regular guarantee and unit warranty had expired, simply to keep customers satisfied and aid in selling them a new refrigerator. Most of Dunn & Dunn's customers come from the finer sections of the city and from the Rutgers University faculty group. Cash sales represent about 30-35% of the dealership's business.

According to Mr. Dunn, competitive relations in New Brunswick are comparatively pleasant. Most dealers feel, he says, that only one of their number uses "chiseling" tactics. The latest venture of this enterprising salesman was to install a 10-year-old box of a certain make in a darkened corner of his showroom and represent it as a two-year-old box.

Customers who came in to look at this dealer's line were taken to the ancient box and asked to listen to the noise it made "after only two years' service." The unnamed dealer had loosened a connection on the evaporator of the 10-year-old, and when the customer smelled the escaping refrigerant he was drawn away from the danger with officious haste and shown a new box from the show floor display.

"Outside of that—," said Mr. Dunn, "New Brunswick is a pretty clean town to do business in."

Recovery Slow in Perth Amboy, Retarding Appliance Sales

Fifteen miles east of New Brunswick lies the industrial town of Perth Amboy, a building trades center of about 35,000 inhabitants, where the writer saw James Arthur, dapper appliance sales manager at the local Public Service branch office.

According to Mr. Arthur, Perth Amboy has been very slow in recovering from the depression's effects because the town's main dependence is upon building industries—tile, brick, carpentry materials, and lumber—which have been stagnant up until last year.

This has affected the business done by refrigeration dealerships in the town, most of which were empty of floor traffic on the Tuesday afternoon which the writer spent in Perth Amboy. But, says Mr. Arthur, the 1936 pick-up was felt in the town, and most dealers feel that the present year will bring business in appliances back to normal.

Two weeks ago, the Public Service Co. sponsored a "Refrigeration League Show" in the local high school auditorium, during which many profit-

able leads were obtained by most dealers. This is an annual affair, at which most of the prominent lines of refrigerators represented by Perth Amboy dealerships are displayed.

Mr. Arthur uses his 20 meter-readers, collectors, and repair men as "bird dogs" on the 14,000-meter circuit in and around Perth Amboy, and from these men a good portion of prospects for the utility's Kelvinator line is obtained.

Washers are the "prize" appliance sales line in Perth Amboy at present, says Mr. Arthur, averaging 125 sales per month. The Public Service outlet has the state's star washer salesman, who also sells refrigerators, and two other salesmen hold positions among the five best washer salesmen in New Jersey.

State Furniture Co. Takes Kelvinator Franchise

OMAHA—State Furniture Co. is a new Kelvinator dealer here. Remodeled first floor of the store includes booths for displaying new refrigerator and appliance models.

Stringham Transferred to Washington G-E Branch

NEW ORLEANS—Ward B. Stringham, local district manager for General Electric Supply Corp., has been transferred to the company's Washington, D. C., branch, which recently took over the G-E appliance franchise from National Electrical Supply Co. His successor here is Carl O. Brown.

Employees of the local G-E Supply branch staged a farewell dinner dance in his honor at the Southern Yacht Club, at which New Orleans utility and refrigeration men were guests.

Grosvenor Appliance Shop Opens in Kenosha

KENOSHA, Wis.—Opening of Grosvenor Appliance Shop was announced here recently by Clifton Grosvenor, who will operate the shop in partnership with William Norlander. Mr. Grosvenor has had considerable experience in appliance merchandising and refrigeration service.

Fairbanks-Morse refrigerators will be included among the appliances handled.

McGranahan Moves to Larger Quarters

TOLEDO—V. J. McGranahan Distributing Co., Kelvinator distributor, has moved into larger quarters at Madison and 17th Sts. The company will have seven large windows available for display purposes. Cost of remodeling and modernizing the new location was approximately \$5,000, according to V. J. McGranahan.

Alabama Appliance Co. To Move April 15

BIRMINGHAM, Ala.—The Alabama Appliance Co., Frigidaire distributor here, has taken a five-year lease on a site at 1801 First Ave., North, and will occupy the premises Apr. 15, it was announced by C. R. Rew, president. The firm is now located at 1917 Fourth Ave., North.

Koch Heads Muskegon Plant for Norge

MUSKEGON, Mich.—A. F. Koch has been named general superintendent of the Muskegon plant of Norge Division, Borg-Warner Corp.



Gimbel Brothers Department Store, Pittsburgh, Pa. Air conditioning installed by York Ice Machinery Corporation. The refrigerant used is "Freon-12."

The Country's Leading AIR CONDITIONED RETAIL STORES use FREON refrigerants

SAFETY of life, health and property is the first consideration in any structure where men and women live, work or shop. Skillful and careful engineering in equipment manufacture and installation has done much to establish the safety records of air conditioning. Use of "Freon" fluorine refrigerants provides additional security against the danger of unexpected mishaps.

"Freon" refrigerants are non-toxic, non-flammable, non-explosive. They are odorless when mixed with air up to 20% by volume. They do not harm foods, fabrics or furs.

"Freon" refrigerants meet all the specifications for safety set by the Underwriters' Laboratories of Chicago. They have been tested by the U. S. Bureau of Mines. 99 1/2% of all mechanically cooled railroad trains use "Freon" refrigerants. They are used in ships, in mines deep underground, in hotels, restaurants, department stores, homes, schools, hospitals, offices, factories—in every type of installation, large or small.

For fullest safety of life, health and property, specify "Freon" refrigerants for your cooling system.

"Freon" is Kinetic's registered trade mark for its fluorine refrigerants.

FREON

REG. U. S. PAT. OFF.

safe refrigerants

HERE ARE JUST A FEW OF THE LEADING RETAIL STORES USING "FREON" REFRIGERANTS IN THEIR AIR CONDITIONING SYSTEMS:

Hale Bros.
San Francisco—Westinghouse
Powell, Inc. Dept. Store
Chicago, Ill.—Frigidaire
Abraham & Straus
Brooklyn, N. Y.—York
Goldblatt Dept. Store
Chicago, Ill.—G-E
F. W. Woolworth Co.
Philadelphia, Pa.—Carrier
The Fashion
Houston, Tex.—Kelvinator
Bloomingdale Bros.
New York City—York
Adeline Shops, Inc.
St. Louis, Mo.—Frigidaire
B. F. Dewees, Inc.
Philadelphia, Pa.—G-E
Miller-Wohl Dept. Store
Kansas City—Westinghouse
Wanamaker's Dept. Store
New York City—York
Jackson-Grave, Inc.
Minneapolis—Frigidaire
Woolworth Store, Broadway and
44th St., N. Y. C.—Carbondale
Alexander's Dept. Store
Bronx, N. Y.—G-E
The Boston Store
Phoenix, Ariz.—Westinghouse
J. C. Penney & Co.
St. Joseph, Mo.—Frick
Rich's Shoe Store
Washington, D. C.—Carrier
Mark Cross Luggage Store
New York City—Frigidaire

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

AROUND THE WORLD WITH GEORGE F. TAUBENECK

Low average incomes, combined with a comparatively cold climate, have stunted the growth of Germany's refrigeration business, both household and commercial. Trade restrictions have further prevented American development of the market. Only 117 machines came in from the United States in 1935.

In this instalment of the editor's "World Series," a condensed analysis of German machines is presented.

AEG Products

(Continued from Last Issue,
Page 10, Column 5)

"Grosse 2," the larger of the "Juniors," has an overall height of 1,415 millimeters, or about 4 ft. 7 3/4 in. "Grosse 1" is 100 millimeters shorter, its height being about 4 ft. 4 in. Because of this shortness, the cabinet doors can be opened by pressing the handle with the knee, even though the handle is in the center of the machine.

Net weight of the complete "Grosse 1" refrigerator is approximately 270 lbs., the cabinet weighing 147 lbs. and the mechanism 123 lbs. Gross, or shipping weight is considerably more, the assembled appliance weighing about 664 lbs. The cabinet weighs 222 lbs. net weight of 336 lbs., and the mechanical unit weighs 194 lbs.

"Grosse 2" is heavier yet. Its net weight is 354 lbs. and its gross weight 664 lbs. The cabinet weighs 222 lbs. net and 462 lbs. gross. Net and gross weights of the machine are 132 lbs. and 202 lbs. respectively.

Handle, hinges, and other trimmings are of polished chrome, and the shelves are of tinned wire in grate form. There is, in "Grosse 1," only one full shelf in addition to the bottom, or floor, of the cabinet interior. Under the freezer is a half shelf to hold a tray, and stepped down from that is another half shelf. In the top left hand corner is a tiny quarter shelf.

Compact Machine

AEG's refrigerating machine itself is a compact unit consisting of a motor, condenser, evaporator, regulator, and liquifier all affixed to a single base in the top of the cabinet. Condenser and impulse motor are mounted upon a frame suspended on springs, thus eliminating noise and vibration.

Of simple construction, the rotary condenser has a high efficiency and a high measure of cold production. The motor has exclusively internally-moved valves, and almost all joinings are either welded or securely soldered.

Moving parts are few, and they are lubricated by a spontaneous flow of oil carried from the condenser housing through grooves and channels.

The impulse motor is adaptable to either type of electric current, and can be operated as a one-phase condenser or as a continuous current compound motor. The impulse of the condenser comes from a rubber wedge belt.

Consisting of a coil of ribbed pipes, the liquifier is mounted behind the motor so that the ventilator on the shaft end of the motor sucks a powerful current of air through it, thus

increasing the efficiency of the ventilator.

Passage of the liquified refrigerant to the condenser is regulated by a spontaneously operating float valve installed on the ground bed of the machine.

Suspended from the underside of the ground bed, the evaporator is shaped to facilitate lively circulation of air in the cabinet and to enable quick, thorough cleaning. Trays are made of aluminum.

Regulation of the machine is controlled by a thermostat connected to the evaporator, the device turning on or shutting off the motor according to the temperature. Hand control of the temperature and the machine is made possible by two buttons on the front panel of the cabinet just above the door. One button is for temperature increase and decrease, and the other is the on-and-off switch.

Ordinary-sized refrigerators can be operated in the warmer seasons on an electricity bill averaging from seven to 10 schillings per month. At the normal rate of exchange, this amount would be equivalent to from \$1.61 to \$2.30. During the winter, the cost of electricity drops to about half this sum.

The Table Hearth

One of the smallest, most compact, yet most serviceable of AEG's household appliances is the household grill with incandescent rod heating. It is almost a cube in shape, its dimensions being approximately 10 in. in height and 11 1/2 in. in width and depth.

Side walls of the grill are finished in ivory enamel, and both the top cover and the back wall are black enameled. The interior of the unit is also finished in black enamel. The front is open to admit the grill pan which fits into the chamber on wall runners, like a drawer slides into a desk.

The pan, which, with a ground-enameled roaster, is provided as an accessory with every grill, has a black wooden handle and ivory enameled body.

Consisting of an electric table hearth and two cooking plates, AEG's electric hearth for household use has automatic temperature regulation. A large aluminum cover mounted on a swivel hinge on the back of the unit can be swung down to cover the plate in which are set the cookers.

Purpose of the cover is to retain heat while pots rest on the circular cooking plates. Hardly any work or care is required of the housewife to operate the stove. She just puts the pans on, closes the cover, and switches on the electric current.

Cologne Is Famous for Its Toilet Water



Next to its twin-spired cathedral, the city of Cologne is best known for the toilet water which bears its name. Above is the interior of a Cologne train shed.

The rest of the cooking is taken care of by the device, for it is continually turned on and off by the automatic regulator whenever a temperature too low or one high enough is reached. No stirring or watching over the pans is necessary.

Beneath the heaters is a steam drawer which pulls out from the left side of the stove just below the switch.

AEG produces two table hearths, in different sizes, both fully automatic and practically identical in construction to the standard machine. The larger of the two table models has its exterior sides enameled an ivory color, its feet and exterior of the steam drawer nicked, and the hearth plate finished in black enamel. The removable aluminum cover is double-walled and is insulated with esparto, a material fabricated from certain types of Spanish and Algerian grass.

Feet, removable plate, and hearth of the smaller table model are in black enamel, the sides and steam drawer exterior being finished in ivory-colored enamel. The cover is practically the same as that of the larger hearth.

Optional with the larger hearth is a black-enameled additional plate with a built-in, special burner which can be attached to the regular frame and used for the preparation of smaller portions of food independent of cooking in the automatic hearth.

Built for a full-sized kitchen, the AEG combination coal and electric hearth has a firing compartment in one portion and an electric range in the other. The hearth is used for cooking and as a room heater.

Hard coal is the best fuel for the furnace, which is a filler fire-room with a shaker grate and fire clay walls. During the warmer weather, the cooking fire may be elevated in the stove by inverting the summer

grate with which every unit is equipped.

To make the heat cover the greatest expanse possible, the hearth has a precipitate draft system. An ascending and descending draft is placed directly behind the firing compartment, and the smoke withdrawal canal is laid along the entire back wall of the hearth.

Besides this, and for the same reason, there is arranged between the coal and electric parts of the hearth an intervening chamber acting as a sort of chimney and permitting the hot air to course from top to bottom. This chamber is not visible from the outside. It also serves as a protector for the electrical arrangement, keeping out a great deal of the stove heat that might harm the wiring.

All sides of the firing portion are arranged to reflect heat into the kitchen. Draft is provided by a slide in the ash door at the bottom. It can be turned off by a valve so that the smoke is carried directly to the chimney, taking with it some of the heat and thus decreasing the temperature in the room.

Two cooking plates are set in the coal hearth, and they are removed by a ring lifter. The electric range also has two cookers, and in addition it has a broiling oven below the switch panel.

Front and side walls, broiling oven door, and switch panel are done in white enamel. Feet, broiling oven frames, hearth plate, and hearth well of the electric range have a coating of black enamel.

Black graphite is used as a finish on the fire compartment, hearth plate, and smoke outlet of the coal stove.

Electric Ranges

Small electric cookers with a capacity of 25 liters, or about 5 1/2 gallons,

form another line of AEG products. They are used as hot water storage tanks for kitchen use.

AEG's larger electric cookers, used in hotels, boarding houses, restaurants, hospitals, etc., have served with considerable efficiency. One type of such cooker is an electric boiling kettle for large kitchens. It has a capacity of 150 liters, or approximately 33 1/2 gallons, and runs on 15 kw.

Another product is a hot water steam storage tank for the maintenance of a number of spigots. Its capacity is 400 liters, or 90 gallons.

For large kitchens, restaurants, and such places, AEG makes a large electric cooking hearth with six big cooking plates. Operation of the stove requires 28.5 kw.

Santo Promotion

Electric refrigeration, from the merchandising standpoint, is not far out of the pioneering stage in Germany, so a major part of the AEG promotion material is still concerned primarily with selling the idea of refrigeration to prospects.

One of the company's promotion pieces discusses in considerable detail the operation of the Santo-Junior refrigerating system, describes the temperature-regulating mechanism, and shows a chart of the even temperatures maintained by a unit during several days' operation.

The cooling unit is explained, and some details of its installation shown. Following that is an outline of the refrigerator's convenience features, such as ease of cleaning the interior, how the door may be opened when the housewife's hands are filled with dishes, and the number of ice cubes available for use by both sick and well.

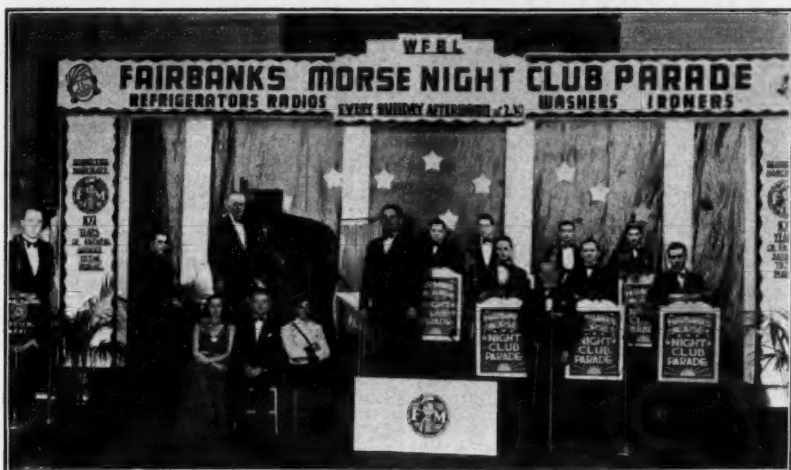
(Continued on Page 14, Column 1)

Modern Berlin Is a Swift-Moving, Streamlined City



(1) Typical scene on a main Berlin thoroughfare. Note the ever-present brief case, carried by the man in the foreground, and the general absence of hats. (2) Socony-Vacuum is all over the world. Here is one of their filling stations in Berlin. Germany loves its automobiles, worships speed. (3) Streamlined chassis.

Broadcasting for F-M in Syracuse



Ready for the regular Sunday afternoon broadcast of the Olmsted Co., Syracuse Fairbanks-Morse distributor, from the ballroom of the Onondago Hotel, over WFBL. Tickets for the broadcast are distributed by F-M dealers. R. M. Brower of the distributorship is credited with developing the audience tie-in.

Alaskan Dealer Uses Boat To Get Jump on Rivals

KETCHIKAN, Alaska—Traveling in his own 30-ft. cruiser, Vance Bingham, ace Alaskan representative of Graybar Electric Co., Seattle Kelvinator distributor, contacts dealers in the eight or nine principal cities of the territory's trading area.

While other salesmen are dependent upon scheduled steamer service in Alaskan waters, Mr. Bingham loads up his cruiser from his headquarters here, and hoists anchor to stop at all convenient coastal points.

According to observers, the modern pioneers who have settled the Matanuska valley project are beginning to demand the same electrical conveniences to which they were accustomed back in "the States."

As a result of this demand, Alaskan appliance sales are booming. The Seattle Graybar unit has extended sales of all equipment except air conditioning to the Alaskan market.

new refrigerator sales, Mr. Stickel avers. Pointing to one unit on the floor, he said it sold four new refrigerators last year—and he thinks it's still a good buy.

"You see, after the people got it, they decided they might as well own a new one," he explained. "We offer the price paid for a used job, if it's traded for a new one—providing both boxes are sold by us."

"Well, this job," patting it, "went out four times—and four times it came back in trade for a new refrigerator. It's been a good little salesman for us. And I still say it's a good buy—if you want a used unit."

The company has been running a test with one of Westinghouse's 1937 models, in a regular home—and results have been so favorable that Ira S. P. Fabruay, president, has sent the meter to the utility to be calibrated for accuracy. The test was started Feb. 4 at 4 p.m., and ended Feb. 22, at 10 a.m.—and during that time, Mr. Fabruay says, the unit used but 6½ kwh.

Range sales should improve this year, Mr. Fabruay says. Last season saw them go for the first time, with about 200 sold in the 25 miles around Harrisburg, most of them in the suburban territory. But the utility has started pushing ranges now, he added—and when it gets behind a product, things usually happen.

Haverty to Retail General Electric in Columbia

COLUMBIA, S. C.—Haverty Furniture Co. has been appointed a General Electric refrigerator dealer here, according to Robert W. Dinkins, store manager.

Porcelain Enamel Institute Issues Selling Point's Book

CHICAGO—"Selling Points for Household Appliances," a 24-page booklet containing aids for selling porcelain enameled products, has just been published by the Porcelain Enamel Institute.

A feature of the booklet is the center spread, which carries the caption, "This Matter of 'Chipping'." A part of the copy reads: "There is as much substance to this chipping bugaboo for major appliances as there is to the ancient story that a frightened ostrich buries his head in the sand, or that the moon is made of green cheese."

Other pages of the booklet are devoted to reproductions of advertisements of the Institute and selling points on various porcelain enameled products.

Air-Minded Dealer Gives Purchasers Plane Ride

ST. JOHNSBURY, Vt.—Keeping customers up in the air has proved a profitable venture for C. A. Padham, Norge dealer in this territory. Mr. Padham owns a "Norge" plane, which he uses in covering his territory. All purchasers of new Norge appliances get free rides.

Kelvin Kitchen Plan Boosts Dealers Sales Volume

HARRISBURG, Pa.—Bodwell Co., Kelvinator dealer, reports 1937 volume running 200% above 1936. The company has been promoting the Kelvin kitchen plan, using the refrigerator as the starting unit in kitchen modernization.

- PROFITABLE SALES METHODS -

Harrisburg Home Appliance Corp. Sold One Used Refrigerator Four Times In 'Build Up' to Sale of New Model

By T. T. Quinn

HARRISBURG, Pa.—Selling electric refrigeration is daily becoming more and more of an over-the-counter proposition, in the opinion of R. H. Stickel, sales manager of Harrisburg Home Appliance Corp., Westinghouse dealer here.

"There's no longer any necessity of selling the public on the advantages of electric refrigeration," Mr. Stickel said. "Most people are interested, willing to buy."

"The problem now is getting them into the store. Once you get them in—and you won't sell many of those you don't—most of your job is done. By far the largest percentage of our sales last year were made on leads picked up in the store."

"It's made a big difference in our sales force, too. From an original staff of six men, we've gradually reduced ours to three. They're kept busy enough following floor leads—and their percentage of sales runs pretty high, because there's no wasted effort made in canvassing. Every call is on a logical prospect, a person who's generally interested in owning a refrigerator, and who can afford to buy one."

"Perhaps we don't get as many leads as we'd have if we canvassed house-to-house, but all our leads are live ones—there's no dead wood—and the housewife is friendly, doesn't feel she's being imposed upon."

Sales in the Harrisburg territory last year were good, Mr. Stickel stated. He estimated Frigidaire led the field with close to 1,000 units, with General Electric second, with about 700, and Westinghouse next, around the 600 mark. Coldspot sales in the vicinity, Mr. Stickel estimated, topped 500 units.

Competition is quite keen, Mr. Stickel said, for both new and used electric refrigerator sales—but the

used refrigerator market isn't worrying him, although he admits "there's plenty doing" in that field.

One local dealer, he says, has raised his new units \$15 to be able to make a more liberal allowance on trade-ins, and that hasn't made things any easier for the rest of the dealers. Mr. Stickel admits that this isn't a bad scheme—but it happens to be one his company can't follow, because the local utility handles Westinghouse, and hangs close to published price schedules.

One thing which would help the trade-in situation, particularly in electric refrigerators, would be some sort of "blue book," in which a price schedule for used units could be set, Mr. Stickel says. Right now, he admits, there are no standards at all—unless you count those of shrewd bargaining.

"Every dealer quotes a different allowance for used electric refrigerators now," he went on, "and the same thing applies to used ice boxes. So the dealer who ends up by offering the most gets the sale—unless another dealer has done such a good job of selling that the customer is willing to 'lose' a few dollars to have the unit she's convinced is the best. And dollars talk a powerful language around here."

"We'll trade for used electric jobs whenever we can—for we never have any trouble disposing of them."

"There are a lot of people—negroes, for example—who never buy new merchandise. They're on the lookout for bargains in electric refrigerators, and that's what we can offer them."

"How much do we make on them? A few dollars over what it costs us to get them into good condition. Our guarantee is for 90 days."

"We sold 35 used jobs last year—and we can sell 40 or more this year,

if we get them, to people who want used units for their homes and to others who own summer cottages in the country and who are tired of handling ice out there three or four months a year.

"Right now we've a deal on with a family who came here from Germany, and who own a German refrigerator. The unit's in fair shape, too, though it does hum like a sewing machine when it cuts on. But we'll trade for it—and sell it, too."

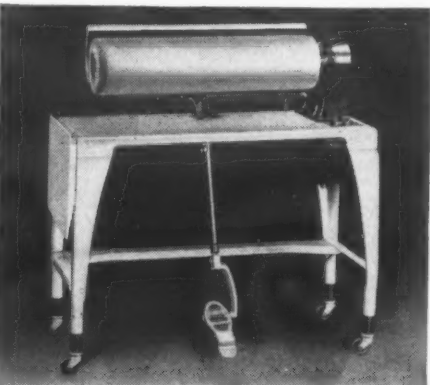
Used refrigerators often help make



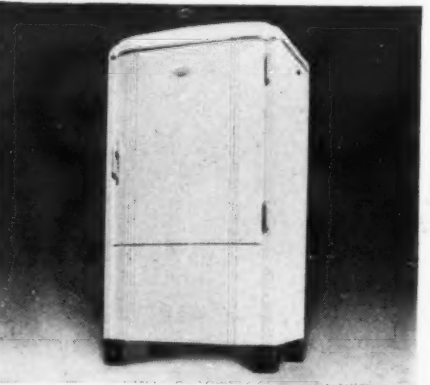
Copeland Washers are offered in 7 outstanding models covering a complete price range.



Both spinner and wringer type washers help you close a larger percentage of prospects.



Speed and simplicity of operation are sales-producing keynotes of the Copeland Ironer.



Twin-cylinder compressors make Copeland Refrigerators mechanically outstanding.

Sell

ONE OF THEM OR ALL OF THEM

But in any case Copeland offers what it takes to help YOU make money

• Whether your interest lies in one, two or all of Copeland appliances, you will find them smartly styled, mechanically outstanding and favorably priced. What's more, you'll find that Copeland offers the ideal dealer franchise with profitable discounts, liberal financing plans and strong advertising merchandising support.

Dealers everywhere are flocking to the Copeland standard. We invite YOU to write or wire for complete information. Address: Mr. J. D. McLeod, General Sales Manager, Copeland Refrigeration Corporation.

COPELAND

REFRIGERATION CORPORATION
DETROIT, MICHIGAN

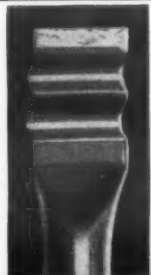
A DALLAS E. WINSLOW INDUSTRY

PIONEER MANUFACTURERS OF REFRIGERATION

WOLVERINE

COPPER TUBING

GET IT AT YOUR JOBBERS



SOLDER
SEALED
Clean

WOLVERINE TUBE COMPANY

1411 Central Avenue • Detroit, Michigan

WEATHERHEAD VALVES

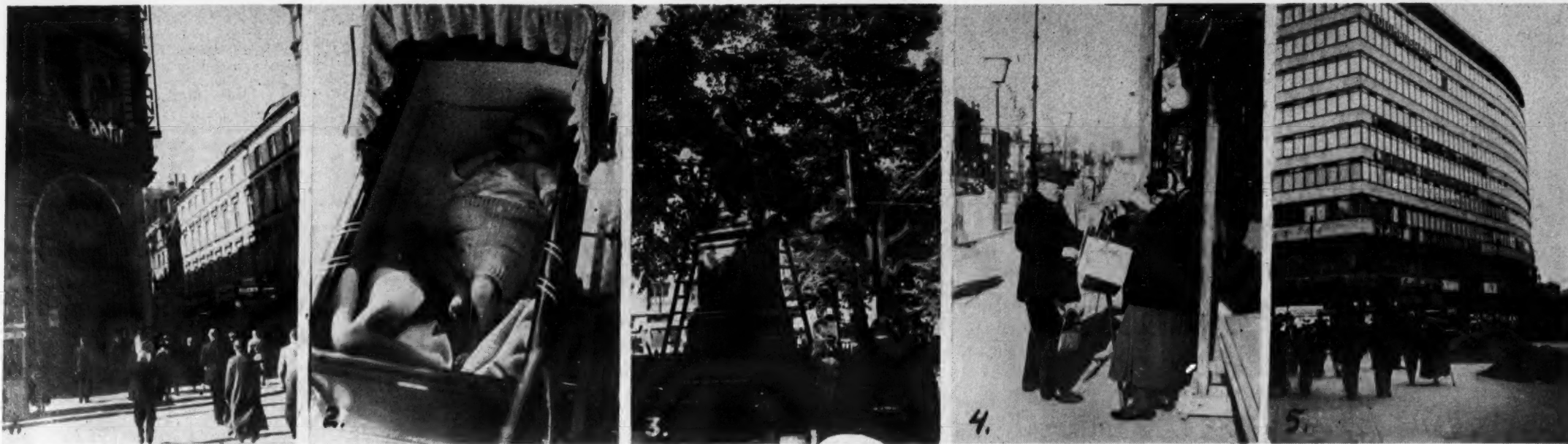
- For easy installation on all refrigeration lines.
- Modernly made from extruded brass rod.

GENUINE WEATHERHEAD REFRIGERATION PARTS

WEATHERHEAD • 300 E. 131 ST. • CLEVELAND, OHIO



- - and Life Goes On in Berlin, Despite National Tension



Germany is a focal point of international tension, and the country itself is tottering at the edge of an abyss. Nevertheless, people still (1) shop for trifles in the arcade at the left, (2) have babies, (3) loaf in the parks, (4) gossip on the streets, and (5) put up modernistic office buildings.

(Continued from Page 12, Column 5)
("Gesunde und Kranke," the booklet calls them.)

Testimonials from satisfied users of Santo-Juniors are printed in the back section of the booklet.

Another AEG promotion piece features Freda, the fat-cheeked German maid who has become one of the best-known figures in German appliance advertising, and pictures her delight at all the food she can keep safely in her Santo refrigerator.

A novel arrangement on the inside two pages of the folder has a Santo-Junior model taking up all of one side, its food compartment door opening to disclose all the various types of provisions which might be stored inside. Shown are meats, dairy products, vegetables, frozen desserts, fruits, and beverages.

Finally, the empty food compartment, with shelves and evaporator, is disclosed. Opposite side of the in-the-door folder tells a brief story of the Santo's value in saving money for the German housewife by quantity buying and keeping foods from spoiling, and stresses the even interior cabinet temperatures which the refrigerator will maintain.

Cold control, easy cleaning, ample ice cubes, and other convenience features are shown photographically on the back cover of the folder.

"Unexpected guests are always arriving" is the theme of a single sheet handout or envelope stuffer, which shows a hostess welcoming visitors who evidently arrived without warning.

Copy stresses the value of a Santo refrigerator in such emergencies, especially in the summer months, when cooling beverages are most welcome and hardest to obtain. With a Santo-Junior, the moral is, the housewife can add to her guests' pleasure in the spirit of true German forethought and hospitality.

Siemens-Schuckert

Another leading firm among German manufacturers of household refrigera-

tors is Siemens-Schuckert, which fabricates an off-peak absorption unit.

Sold through dealers, electric power companies, and its own retail branches (the "Protos" stores—a retailing corporation affiliated with Siemens-Schuckertwerke A.G.) the Siemens-Schuckert "Protos" refrigerators are manufactured in the following sizes: 2.1, 2.8, 4.25, 7.1 and 10.6 cu. ft.

They utilize a dry air-absorption method (Normelli Patent), in contrast to the compressor system mainly used in America. The alternating evaporating and reliquidizing of the cooling medium is released through current heat rather than through motor-driven power.

A short period of time occupied by taking in power (fluidizing the cooling medium) is always followed by a period of cold-generation (evaporating of the cooling medium) which lasts approximately six hours.

A cold-storage space joined with the evaporator stores a large amount of this cold air during that period, and then release it to the cooling space again, thus serves to keep equalized low temperatures in the food-storage space.

As the "Siemens-Dry-Absorber" takes up % of its electric power during the night, a very low night current rate offered by most electric power companies in Germany is therefore made available.

Kleinkaltemaschinen

German words are notorious jaw-breakers. The term for small refrigerating machines is "kleinkaltemaschinen." Think of the difficulty a salesman must encounter trying to sell something with a name like that.

In addition, the climate is colder than it is in the United States, and average incomes much lower. Saturation of the household market, you are not surprised to find, is no more than one to every 1,000 inhabitants.

According to Herr Braun-Angott, an engineering statistician whose reliability is vouched for by Siemens-Schuckert, 30,598 machines were manufactured and sold in 1935 in Germany.

This number was reached after totaling the figures furnished by the following firms, and adding 2,000 more units as an estimate for the sales of other German firms:

General Electric Co. (AEG), Berlin; Bitter-Polar Co., Kassel; Brown, Boveri & Co., Mannheim; German Refr. & Power Machine Co., Scharfenstein; Electrolux Corp., Berlin; First Asberger Ice-Box Factory (Carl Fink), Asberg; Siemens, Schuckert Corp., Berlin; Lumaphon Corp., Nuernberg; Lindes Ice Machine Co., Mainz-Kosheim.

The firms mentioned above sold a total of 2,558 machines for export. Based on these figures, it is estimated that the total export sales would reach 2,700, or about .09 of the entire production.

The number of refrigerators imported is not revealed by commercial statistics available. But inasmuch as the United States unquestionably sends practically all of these the number of American importations only were given consideration. These were only 117 during 1935, against 1,560 in 1934. Refrigeration parts imported from the U.S.A. during 1935 had an approximate value of 12 times that of the complete boxes sent over.

Final grouping of the figures on the sale of mechanical refrigerators in Germany in 1935, would therefore be as follows:

Total sales by German firms.....	30,598
Number imported	117
Number exported	30,715
Number sold in Germany	28,015

Against the preceding year's total sales of approximately 10,000 (units) there was an increase of almost 300% in German refrigeration sales in 1935.

These figures by far outdistance the sales of electric ranges.

There exists considerable dissension as to production cost figures on German mechanical refrigerators.

About the only agreed-upon figure in this connection is that dies and tools for a single model may reach the sum of 15,000 to 20,000 German marks.

Herr Braun-Angott offers the fol-

lowing table comparing the manufacturers—and their products—during the seasons 1931-32 and 1934-35.

	1934-35	1931-32
1. Firms manufacturing small refrigeration machines	46	43
2. Number of machine constructions	73	55
3. Machines without piston rods	8	5
4. So-called aggregate for household and industry, constructed upon block-like frame	37	28
5. Industrial compressors of greater effect and stronger construction	24	18
6. Absorption machines (only for household chests)	4	4
7. Compressors with rotary pistons	7	7
8. Compressors with oscillating pistons	62	44
9. Number of machine constructions working with ammonia	26	21
10. Number of machine constructions working with methyl-chloride	19	16
11. Number of machines constructions working with sulphuric acid	23	14
12. Number of machines working with Freon (F12)	1	1
13. Number of machines working with ethyl-chloride	3	2
14. Number of machine constructions working with dimethylether	1	1

Leading Makes

From various authorities we received information on leading makes of small German refrigerating machines, and their characteristics, all of which can be compiled and presented as follows:

1. Edward Ahlhorn, Joint Stock Co.; trade mark: Ahlhorn.

Stationary capsule compressor, simple working, oscillating pistons, wedge belt impulse, plastic metal piston rod packing, rolling bearing, water-cooled condenser, inundated bundle pipe evaporator with floating valve on the high compression side. Refrigerant: ammonia.

2. Universal Electrical Co., Berlin; trade mark: "Santo."

Santo Limited Liability Co. Henningsdorf; Osthavelland. Rotary piston

compressor with air-cooled condenser; refrigerant: sulphuric acid. To one suspendable block are built damper, condenser, compressor, motor, and regulator.

Belt impulse of the compressor, sliding ring piston rod, motor power 1/2 hp., current expenditure 0.2 kilowatts per hour, direct evaporation, inundated damper (evaporator) with floating regulator, cabinet model with 125-200 liter refrigerating chamber.

"Santo Junior" was marketed first in 1933; 2 sizes 130 and 205 L capacity; may be had for A.C. or D.C. and may easily be changed over. Both sizes are the same in detail and use the same cooling plant but in the 205 L a larger evaporator. The cabinets consist of two steel compartments between which lies a well-proportioned heat-resisting layer. The inner cabinet is of white enamel and the outside is lacquered. The door is self-opening by pressure on a lock which has no handle—even by knee pressure. The large cooling space of size 205 L makes it equally suitable for small business concerns as well as large households.

The cooling system works on the compression method. All cold-producing parts are assembled above the food compartment. It is only necessary to set the machinery into the cabinet. Motor and compressor are mounted on springs on the frame and run noiselessly and without vibration. The evaporator is smooth and may be easily reached. Temperature control and semi-automatic defrosting as well as a thermic motor guard are part of the regulating system.

Bayer

3. Bayer Bros., Machine Factory, Augsburg. Trade mark: "Bayer."

a. Methyl-chloride Machines.

Stationary, simple working compressor, oscillation sliding ring piston rod, ballbearing. Water and air-cooled condensers, dry evaporator with expanding valve.

Regulation of temperature by thermostat or pressurestat. Refrigeration chamber 160-300 liter available. (Concluded on Page 15, Column 1)

Nazi Regime Makes Use of Lotteries to Replenish Drained Treasury



First two pictures show street booths for the sale of public lottery tickets, proceeds from which are a welcome contribution to the severely strained national finances. (3) On the left, a recruiting station for the Nazi army; in the foreground, a bookstore on wheels.

Around the World

(Concluded from Page 14, Column 5)
able space, milk cooling, night current arrangement.

b. Ammonia Machines.

Stationary, simple working compressor, oscillating pistons, belt impulse, sliding ring piston rod. Water cooled condenser. Dry and overflow evaporator, expansion valve, float regulator, overflow.

c. "Polaris" Refrigerator.

Periodically working absorption refrigeration apparatus with semi-automatic manner of operation, insertion of circuit by hand, cutting off of heating and regulation of cool water spontaneous.

Night current appropriation. Fuel: electricity or gas. Refrigerant: Ammonia. Absorbent: water. Heating period: 1½—2 hr., coolness lasts about 1 day. Water-cooled condenser.

Refrigerators with ice production for household and business. Finished article: without or outside sheet steel, lacquered white; with zinc metal or outside sheet steel, enameled white.

Bergedorfer Eisenwerk

4. Bergedorfer Eisenwerk A.G. Aktiengesellschaft (Joint Stock Co.). Astra-works, Bergedorf, Hamburg. Trademark: Astra

1. Type MT Methyl-chloride.

Block arrangement, standing, simple-working two cylinder compressors, oscillating pistons, wedge belt impulse, sliding ring piston rod. Air-cooled lamina condenser, lamina-evaporator with thermostat. Regulator, temperature regulation by thermostat.

2. Type ARE (Ammonia).

Block and divided arrangement, stationary, simple-working one and two-cylinder compressor, oscillating pistons, ball bearing, wedge belt impulse, water cooled bundle pipe condenser, ribbed pipe evaporator with thermostat.

Regulator valve and dry evaporator, bundle pipe evaporator for brine with floating regulator and inundation, temperature regulation by a thermostat.

3. Business Icebox (MT-aggregate)

Net contents from 0.71—3.30 cu. meters.

4. Type ET (Ethyl-chloride) for cooling of milk.

Block arrangement with milk cooler, rotary-piston compressor, flat or wedged belt impulse (drive), water-cooled bundle pipe condenser for greater performance, built-in irrigation condenser for smaller performances.

Ice Industry's Radio Program Changes Time

CHICAGO—Beginning Sunday, Apr. 4, the ice industry's NBC red network radio program, featuring Gladys Swarthout and Frank Chapman, is now broadcast from 10 to 10:30 p.m., E.S.T., replacing the General Motors Symphony concert usually heard at that hour.

Beach & Baldwin Establish Public Relations Firm

NEW YORK CITY—Brewster S. Beach and William H. Baldwin have announced their association as consultants in public relations and publicity under the name William H. Baldwin—Brewster S. Beach.

Mr. Beach, formerly advertising manager of Carrier Corp., has been associated also with General Electric Co. and American Radiator Co. He is now handling publicity for Aerofin Corp. American Society of Heating and Ventilating Engineers, and other organizations in the air-conditioning, heating, and ventilating fields.

Mr. Baldwin has handled public relations for International Nickel Co. and other large organizations.

3 Niagara Frontier Power Companies Consolidate

BUFFALO—Niagara Frontier electric customers from now on will be served by a new corporation called Buffalo Niagara Electric Corp., according to announcements made here last week.

The Buffalo General Electric Co., the Niagara Electric Service Corp., and the Tonawanda Power Co. on April 1 filed a certificate of consolidation with the Department of State in Albany, following receipt of an order of the Public Service Commission approving the consolidation.

The announcement made by Col. William Kelly, president, Buffalo Niagara & Eastern Power Corp., parent company for the three operating units involved in the consolidation, points out that the move is a further step in the simplification of the corporate structure of the Niagara Hudson Power System, and reduces the number of system companies to 33 from a total of 59 in existence on Dec. 31, 1929—the year the Niagara Hudson Power Corp. was formed.

Following the formation of the new corporation, a new schedule of electric rates will be filed, which will reduce the cost of service to commercial consumers. Changes effecting reductions will be made also in some industrial power classifications.

In the consolidation petition, it was pointed out that the companies now own plants and render electric service in contiguous territory, and their electric lines are interconnecting.

Further economies and increased efficiency are expected to result from the consolidation, intercompany transactions and arrangements will be eliminated, and further improvements, extensions, and betterments will be facilitated, it was stated.

Officers of the new corporation are: Horace L. Mann, president; vice presidents, Norman R. Gibson, Col. William Kelly, Edward D. King, Paulding F. Sellers, Merrill E. Skinner, Herbert M. Sharp; vice president and counsel, Warren Tubbs; vice president and secretary, Charles D. Warren; treasurer, George J. Brett; assistant secretary and treasurer, William C. Bingham; assistant treasurer, Arthur W. Jackson.

Chase Made Executive Of New Haven Utility

NEW HAVEN, Conn.—Alfred W. Chase, formerly sales manager of United Illuminating Co., electric utility serving New Haven and Bridgeport areas, has been elected secretary-treasurer to succeed Albert W. Kraft, who was named president of the company.

Coming to the utility in April, 1935, when it began to merchandise refrigerators and other major appliances, Mr. Chase supervised the installation of showroom facilities in New Haven and Bridgeport areas, developed a sales organization, and perfected co-operative arrangements with dealers in both cities.

Refrigerator dealer associations were formed in both communities, and a lower rate scheduled for residential users was effected.

Previously Mr. Chase served as president of the Connecticut Electric Refrigerating Co., distributor for Westinghouse.

Joslin's Opens Second Neighborhood Store

DENVER—Second of several projected neighborhood appliance stores operated by Joslin's in the Denver area was opened recently at 3394 Broadway, with M. J. Ivey as manager. The first Joslin branch was opened several months ago under management of F. W. Iseninger at 4536 East Colfax.

Joslin branches are located in outlying districts of this city to make possible more efficient service to customers, faster deliveries, and better coverage of territory. Neighborhood stores carry electric refrigerators, gas ranges, washing machines, ironers, and complete lines of smaller appliances.

Sales staff of the new South Broadway outlet consists of eight men and women, who work both the field territory and on the floor.

Economy Demonstrations Needed, Bandoli Says

DETROIT—If domestic refrigeration salesmen want to make substantial inroads into the low-income bracket market, they must show their prospects what careful operation means in terms of increased efficiency and decreased cost, declares Marvin S. Bandoli, domestic refrigeration sales manager of Kelvinator division, Nash-Kelvinator Corp.

"The majority of the future buyers will be in the lower and middle-income bracket classification," Mr. Bandoli said. "They are the buyers who have to watch their refrigerators and their pennies to get the most for their money."

Prospective buyers should be advised about opening the refrigerator door too frequently, defrosting the unit too often or not often enough, and running the unit at too low a temperature—three factors that increase operating costs, Mr. Bandoli said.

In covering these points, the salesman should explain to his prospect first, that by planning the trips to the refrigerator the number of door openings can be cut down; second, that the unit should be defrosted on an average of once every two weeks; and third, that a temperature of between 45 and 49° F. will provide adequate refrigeration.

"People who complain that they don't have enough ice cubes for parties should be told to freeze cubes in advance and store them near the freezing unit," Mr. Bandoli added.

Ace to Retail Norge

MIAMI, Fla.—Ace Norge Co. has opened as a Norge dealer here. A. W. Harp is president of the new firm; Olga Johnson is secretary-treasurer.

Gould-Morris Opens as Raleigh Westinghouse Dealer

RALEIGH, N. C.—Formal opening of Gould-Morris Electric Co., Westinghouse dealer, was held here recently at the firm's location at 105 W. Martin St.

The company will handle other electrical equipment in addition to the Westinghouse line, and will maintain radio service and electrical contracting departments.

Officers of the new firm are: Arthur A. Gould, president; Fred S. Gould, vice president; Edwin H. Morris, Jr., secretary-treasurer; Elizabeth T. Gould, assistant secretary-treasurer.

President Gould was formerly associated with the Atlanta branch of Westinghouse Electric Supply Co.

Gates to Promote Servel in Mich.-Ind. Territory

DETROIT—James H. Gates has been named rural sales promotion representative for Servel, Inc., to cover the lower Michigan peninsula and the South Bend and Fort Wayne territories in Indiana.

Hostetler Names Needham Norge Dealer

KIRKLAND, Wash.—Hostetler-Norge Store, Seattle, has extended its operations to this city by placing a complete line of Norge appliances with Needham Electrical Service, according to William Hostetler, president.

Meis Bros. to Handle G-E in Terre Haute

TERRE HAUTE, Ind.—Meis Bros. department store has been appointed General Electric dealer here.

Cavers Bros. Plan Dealership In St. Catharines, Ont.

PLAINFIELD, N. J.—Brothers Fred and Arthur Cavers, for three and one-half years with Home Service Appliances, General Electric dealer, will open their own store in St. Catharines, Ont., Canada.

Coming from Canada nine years ago, and soon after followed by his brother, Fred Cavers became manager of Home Service Appliances' store here and in Perth Amboy, N. J.

The brothers were guests at a farewell dinner in Orange, N. J., attended by 27 men representing Home Service Appliances, General Electric Co., and Philip H. Harrison Co., Newark.

The dinner was arranged by a committee from the Harrison firm, including John Eick, Jr., George Mitchell, David Collins, and Bud Purcell. Otto Nelson, Harrison's wholesale manager, was toastmaster.

Speakers were: Philip H. Harrison, New Jersey G-E distributor; Robert Graves, G-E laundry equipment representative; Thomas Babson, secretary and merchandise manager of the Harrison company; and Frederick M. Williams and Sam Levin of the G-E Elizabeth and Perth Amboy stores, respectively.

Olmstead Completes New Appliance Salesroom

SYRACUSE, N. Y.—Olmsted Co., local appliance distributor, recently completed a new appliance salesroom on the second floor of its headquarters here.

Howard S. Kaslin, general manager, says that all major appliances handled by the company, including Fairbanks-Morse refrigerators and radios, and Thor washers, will be displayed in the new salesroom.



**They're
AIR-CONDITIONED!**

**THESE HAPPY YOUNGSTERS CAN ENJOY
DANCING ON THE HOTTEST
SUMMER NIGHT**

It's sweltering—outside. The heat is torture! Yet in this air-conditioned salon dancing is a pleasure, a happy rhythmic exercise cooled by air as gracious as gentle zephyrs.

Air-conditioning, the modern marvel, requires, among other things, a dependable refrigerant. Manufacturers and service engineers know EXTRA DRY ESOTOO and V-METH-L are dependable. Do you know of the method worked out by the makers of EXTRA DRY ESOTOO and V-METH-L for use of these refrigerants? Write for reprint of an article describing this method.



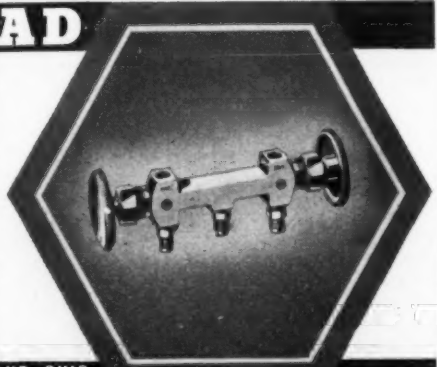
VIRGINIA SMELTING CO.
WEST NORFOLK, VIRGINIA

WEATHERHEAD TESTING VALVES

• A necessity for charging gas or oil in low and high sides—testing for leaks—purging gas from high side or gauge line—setting valves and controls. Weatherhead Testing Valves make all of these operations simple and accurate.

GENUINE WEATHERHEAD REFRIGERATION PARTS

WEATHERHEAD • 300 E. 131 ST. • CLEVELAND, OHIO



AIR CONDITIONING AND REFRIGERATION NEWS

Established 1926, Registered U. S. Patent Office as Electric Refrigeration News.

Published Every Wednesday by
BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich.
Telephone Columbia 4242.
Cable Address: Cockrell-Detroit

Subscription Rates
U. S. and Possessions, Canada, and all countries in the Pan-American Postal Union: \$4.00 per year; 2 years for \$7.00. All other foreign countries: \$6.00 per year. Single copy price, 20 cents. Ten or more copies, 15 cents each; 50 or more copies, 10 cents each. Send remittance with order. Notice: Please do not pay money to strangers claiming to represent this paper. We employ no subscription solicitors. Send orders and remittances by mail.

F. M. COCKRELL, Publisher

GEORGE F. TAUBENECK, Editor
PHIL B. REDEKER, Managing Editor
THEODORE T. QUINN, Assistant Editor
WINIFRED HUGHES, Assistant Editor
Departmental Editors:
K. M. NEWCUM, Refrigeration Service
F. O. JORDAN, Air Conditioning
Staff Reporters:
WILLIAM H. LONG, ALFRED JONES,
JAMES MCCALLUM, and R. H. POTTER

R. T. CARRITHERS, Advertising Mgr.
HELEN K. GILMORE, Asst. Adv. Mgr.
JAMES B. SMITH, Asst. Adv. Mgr.

JOHN R. ADAMS, Business Manager
ROBERT P. NIXON, Asst. Business Mgr.
JEAN H. ADAMS, Subscription Manager
LOLA E. DEW, Circulation Manager
WINIFRED MERSON, Spec. Representative

Advertising Representatives:
John B. Gallagher Co., Inc.,
11 W. 42nd St., New York, N. Y.
Pennsylvania 6-1380
Lewis & Noelle
612 N. Michigan Ave., Chicago, Ill.
Superior 8550

Member, Audit Bureau of Circulations
Member, Associated Business Papers

VOL. 20, No. 15, SERIAL No. 421

APRIL 14, 1937

Copyright, 1937, Business News Pub. Co.

More Effective Window Displays

WINDOW DISPLAY, unique among promotional aids in that it unites prospect, merchant, merchandise, and sales story at the actual point of purchase, is necessarily an important factor in the merchandising of electrical equipment.

And when the field sales representative of a manufacturer or distributor spends half a day selling a dealer on the wisdom of devoting considerable time and thought to the creation of proper displays—or to the efficacious use of displays made available by the factory—he is investing his energies wisely.

For in utilizing the powers of display, the dealer is making a direct appeal to some of the most fundamental of human responses. Psychologists divide all animal reactions into two classes: approach and withdrawal. From a basis of two or three fundamental stimuli the human nervous organization, by means of "conditioning" processes, builds up its complicated system of likes and dislikes, desires and rejections. And the very first "approach response" to be found on any list is that of light.

Attraction of Light, Motion and Color

Even babies will try to move toward light; and its power of attraction for all other forms of animal life, including insects, is known to everyone. Two other stimuli which invariably draw the attention of man and beast are motion and color.

Is it not reasonable to suppose, then, that the wise dealer will do his best to employ all three of these factors in his window displays, in order that he may gain the attention of passers-by to the products he has for sale?

Conceding that the window display—by effective manipulation of the fundamental stimuli of light,

color, and motion—has high powers of attraction and appeal, the dealer shouldn't take it for granted that he can put up one good window display, and then sit back and take it easy. It must be changed frequently, and it must always bear the stamp of originality.

Window Displays Must Arrest Attention

Window displays work in a highly competitive market. To illustrate: When a man sits down in an easy chair with a newspaper or magazine he is already in a frame of mind to read. His attention is focused on a very small area. (Even so, creators of periodical advertisements are constantly exercising their ingenuity to attract and hold the already preempted and adjusted eye of the reader.)

But the public for which window displays are intended has a thousand and one distractions—crowds of people, the exigencies of driving a car, conversation, noise, and the tumultuous kaleidoscope of any city street. Advertising intended for this sort of audience must have unusually compelling powers of attraction and conviction.

Importance of Circulation

Vital ingredient in successful window display promotion, as in any other advertising medium, is circulation, or the number of people to whom the advertising message is exposed. Consequently, since the days of the crossroads store, American merchants have sought to locate their establishments where they would be available and convenient to the most buyers. In the case of window displays, circulation means passers-by. If the store is well located, the display window is probably its most effective selling tool.

Quality as well as quantity is an important element in evaluating pedestrian traffic, for quality is inseparable from quantity in determining buying power. Quality and quantity both vary, however, according to individual locations and situations, so each dealer must analyze these factors for himself. For example: A clocker might report that 500 persons pass a certain window daily, but if the store is adjacent to a school, 300 of these may be children.

Also important in the consideration of window displays is the length of time that each individual is exposed to the display. Repeated surveys have established an average exposure period per individual of five seconds, although this figure, too, varies according to specific situations. Which means that the message must be brief, simple, and quickly grasped.

How the Average Dealer Uses Display Materials

Field representatives report that most dealers are too prone to take their displays for granted, and that most of them are definitely satisfied with the results of their window displays, in spite of the fact that they make little or no effort to check their results. The majority of them use factory-supplied material according to instructions, and let it go at that.

Preference of the average electrical dealer for display material runs first to signs, then to cards, litho cut-outs, posters, and crepe paper decorations. He spends a little more than 1% of his gross annual income for displays, and changes his window weekly or twice monthly. Generally the

setting up of the displays is left to a subordinate.

It is generally found that the average electrical dealer has his store either in the central shopping district or on its fringe, and that his store has at least two windows, only one of which is equipped with X-ray reflectors for spotlighting special display material. Other windows expose the interior of the store.

Worthy of More Than Mere Mechanical Handling

It should occur to the thoughtful dealer that the precious space of the single window which he devotes to special displays is valuable enough to deserve more than mechanical attention—which is all it gets if he simply installs the displays furnished him.

Study of the traffic which passes his store, combined with knowledge of the interests of the people in his community, may suggest to him a number of ways in which the messages in these displays can be tied more closely to the particular peculiarities of the traffic which his location brings him.

The small-town window combination of product, flies, cat, and notice of the Ladies Aid Pie Supper may have little merit; but on the other hand, the elaborate display designed for 52nd St. and Park Ave. may have scant appeal for Main St. Inasmuch as factory window display experts are more apt to think in terms of metropolitan audiences, it is up to the village or suburban dealer to work out his own adaptations.

Local events, like football games, commencement exercises, fairs, holidays, home talent plays, elections, and the like can often be tied up with standard displays in a manner that may hold the attention of the passer-by longer than the standard five seconds.

Originality Always Needed

Metropolitan dealers will find that their use of light, color, and motion must also have novelty; for in addition to all the distractions mentioned previously, their windows must stand up under the competition of a thousand other window displays.

Selling through the eye is undoubtedly the most effective sales method; and in the window display the dealer has his best opportunity of selling visually. But window display practice is both an art and a science; and certainly is something that cannot be taken for granted. Each case requires individual study; and such study generally is well rewarded.

— LETTERS —

What Is an Orphan?

General Electric Co.
Schenectady, N. Y.

March 29, 1937

Publisher:

In December, 1932, you printed a list of the names of the 111 manufacturers of domestic refrigerators who had gone out of business, and 47 more that could not be reached by mail.

It would be interesting to know after about five years have passed, how many more orphans there are on the market. Perhaps there are as many orphan refrigerators as there are orphan automobiles.

Somebody asked me once which was worse—an orphan automobile or an orphan refrigerator, and I replied: "You can tow an orphan automobile."

I think you would be making a great addition to human knowledge if you would make another survey—under up-to-date conditions.

C. M. RIPLEY,
Publicity Dept.

Answer: You will find the names of all active and defunct refrigeration

companies in the 1936 Specifications Book. In addition to the names, there is included the available historical record regarding those companies which have passed out of the picture.

If you will study this record you will understand why it is rather difficult to say definitely just how many companies have made electric refrigerators at one time. Some of these companies were merely organized and never really functioned as manufacturers. Some of them assembled a few units. Others went through various reorganizations. The list also includes manufacturers of commercial and industrial equipment.

With further reference to the matter of orphans, we have always been a little skittish about anything in the nature of dramatic emphasis upon such names because of the possibility of error. It is hard to tell just when a particular make may be conclusively designated an "orphan."

Should We Reprint All Air Conditioning Installation Data in Booklet Form?

York Ice Machinery Corp.
York, Pa.

Editor:

We have noticed in various issues of AIR CONDITIONING AND REFRIGERATION NEWS, the lists of air conditioning installations by cities and utilities throughout the country, which give the classification; i.e., hotels, theaters, offices, etc.; manufacturer of equipment, H. P., and other data.

We would very much like to have a copy of the complete list and are wondering if you can accommodate us. We realize, of course, that this information can be had by clipping back issues of the NEWS, but it would greatly facilitate matters if we could get it in other form. You may also have information not yet published.

We would be willing to pay for the expense involved in compiling this, and would like to hear from you regarding the matter.

J. L. ROSEN MILLER, Manager.

Answer: We have all of this data, which has been published in the NEWS, standing in type and could re-publish it in the form of a booklet at a reasonable expense. Perhaps other manufacturers of air-conditioning equipment would be interested in having this record available in convenient form. A rough estimate indicates that the data will fill about 64 pages, size 6 1/2 x 8 1/2 inches (which is the standard size of the Directory, Manuals and other books).

If you would like to distribute copies of the book to your organization, please let us know about how many you can use. The principal items of cost are those involved in getting the material ready for the press, therefore the cost per copy will depend upon the total quantity which may be sold.

More Nerve Needed

Clark-Bracken, Inc.
120 Fifth Ave., S., La Crosse, Wis.

Editor:

I want to compliment you on the editorial you wrote in the recent issue of your NEWS regarding the strike situation in Detroit.

We should have a few more people with the same nerve to write more editorials of the same nature and tell in plain words what they think of the boys who take things over for themselves regardless of who owns it. Thanks for the good work your weekly is doing to help out all of us selling home appliances. Keep it up.

G. B. BRACKEN

A Real Value

Morristown, Ind.
March 29, 1937.

Gentlemen:

Enclosed you will find twenty cents for which please send me another Specification book of the 29 makes of refrigerators.

We sell Kelvinators and would like to have a book for the store and one to save. It is a real value that is worth several times the price. Sure hope you are not sold out.

FLOYD ECK.

Readers Wear It Out

Pound & Morre Co.
Frigidaire Department
Charlotte, N. C.

Editor:

Your REFRIGERATION NEWS has come to this concern for some time, and you may be sure that the paper is very nearly worn out by the time it has made the rounds of some very careful readers. Speaking for myself, I have found it a source of accurate, timely information.

However, I found it advantageous to accept an engineering connection with another firm, and hence the necessity for subscribing personally to REFRIGERATION NEWS. I am wondering whether there is a price concession at this time for a combination with Mr. Jordan's "Air Conditioning Made Easy." If so, I shall want to take advantage of it.

At any rate, the subscription should

start with the March 17 issue; if there is a possibility of running short of these issues, I shall appreciate your reserving my copies until I hear from you concerning the proper remittance.

Also, I should like to receive a copy of your Red Book and to have my name placed on your catalog mailing list.

J. G. MURHEID,

Sales Engineer.

P.S. Mail should be addressed in care of Page-Williamson Corp., 423 South Church St., Charlotte, N. C.

One for Each Salesman

Losher's

809 Tenth St., Modesto, Calif.
March 30, 1937

Gentlemen:

We would appreciate it very much if you would send us six (6) copies of REFRIGERATION NEWS issue under date of March 17th, covering "Specifications of 243 models of 29 makes of Household Electric Refrigerators in this Section."

We find this bulletin to be very useful in our line of business, and desire copies for each salesman.

H. LOSHER.

A Problem-Solver

National Association of Power Engineers—Arizona No. 1
Phoenix, Ariz.

Sirs:

Inclosed please find P. O. money order of \$3.50. I wish to buy THE REFRIGERATION ENGINEER'S MANUAL; should above amount not cover cost of book and mailing please send balance C.O.D.

I have your MASTER SERVICE MANUAL and I find it the best book of its type that I have ever seen; hoping to receive your book soon, as I am sure it will help me solve some problems that I have encountered.

BARNEY SIEBERT

Need Representation In Argentina?

Schilder Brothers
3979 Canals St.
Buenos Aires, Argentina

Sirs:

We have the pleasure of requesting some of the latest sample copies of AIR CONDITIONING AND REFRIGERATION NEWS, and the price of the yearly subscription of the same.

At the same time, we would be pleased if you would put us in direct communication with some factory of domestic electric freezers and commercial equipment; also factories of parts and accessories such as: motors, compressors, condensers, valves, etc., for electric refrigeration, who are not represented in Argentina, and who are ready to grant exclusive representation in this territory.

SCHILDER BROTHERS.

Manufacturer of Armature Balancing Machine

S.I.A.M.
Sociedad Industrial Americana
Maquinarias
Di Tella Ltda.
Avenida Mayo 1302
Buenos Aires, Argentina

Editor:

We have seen on page 16, Vol. 19, No. 11, serial 399 REFRIGERATION NEWS of Nov. 11, 1936, a description on motor repair service and its problems by George Tatem.

We shall appreciate your letting us know the address of the manufacturer of the balancing machine shown on Fig. 1.

Answer: The balancing machine is manufactured by the Electric Refrigeration Motor Co., Inc. (Ermco) 1825 Wylie St., Philadelphia, Pa., of which George C. Tatem is president. For any additional information concerning the machine write to them.

No Gaps Wanted

The E. W. Lape Store
Piqua, Ohio
Mar. 22, 1937

Gentlemen:

We notice by the dating on the address label on the REFRIGERATION NEWS wrapper that our subscription expires on Mar. 26.

Our check for renewal is enclosed. Please see that this reaches the subscription dept. promptly, for we do not want any gap in our files of this publication. We feel that this magazine is invaluable to us in our business.

E. W. LAPE, JR.

New High

403 Virginia Road
Fullerton, Calif.

Editor:

I am anxious to obtain some copies of back issues of the REFRIGERATION AND AIR CONDITIONING NEWS, and am enclosing the sum of \$2.00 in payment for same.

May I take this opportunity to congratulate the staff of the NEWS for its splendid work in preparing and editing the paper. I have never before valued a subscription as highly as my NEWS and am always looking forward to each succeeding copy.

JOHN W. POTTS

138 Unit Systems Condition Offices in Hutchinson Bldg.

HUTCHINSON, Kan. — A central plant system and 138 "office-controlled" unit conditioners have been installed by Carrier Corp. in the Wolcott Bldg. to provide year-around air conditioning for this large, modern office structure.

The central system conditions the building's first-floor shops, while the unit conditioners are installed in individual offices.

Filtered air drawn from the top of the building is circulated through the offices. Cooling water for use in the compressors is obtained from a well in the sub-basement.

Air conditioning was prominently featured in the building's promotion.

Spitzley Names Domestic Co. Delco Heating Dealer

DETROIT — Appointment of Domestic Air Conditioning Co., Inc., to handle sales of Delco-Conditionair winter air-conditioning equipment in the Detroit metropolitan area has been announced by R. L. Spitzley, president of R. L. Spitzley Heating Co., Michigan Delco-Conditionair distributor.

In the past, Spitzley has handled retail sales directly from its local headquarters, but increasing business has necessitated a change of policy in Detroit as well as other Michigan cities, Mr. Spitzley said.

F. E. Ritzenheim is president in charge of sales of Domestic Air Conditioning Co., and A. M. Koldstad is vice president and general manager.

— AIR CONDITIONING NEWS —

Dr. Mills Sees Greater Efficiency in South

NEW ORLEANS—Urging adoption of air conditioning as a means of increasing the South's resistance to disease, Dr. C. A. Mills, professor of experimental medicine at the University of Cincinnati, told the Electrical Association of New Orleans at a meeting in Roosevelt hotel that "even tuberculosis can be treated anywhere, if air conditioning is used in buildings."

"Infectious diseases find the Southerner less resistant because of lowered bodily vigor," Dr. Mills said, "but this can be counteracted by air conditioning. The efficiency of the South will increase with its adoption."

Nelson Adds 10,000 Ft. To Factory Space

MOLINE, Ill.—Herman Nelson Corp., manufacturer of heating, ventilating, and air-conditioning equipment, has recently added 10,000 sq. ft. of floor space to its main factory, according to Robert W. Nelson, sales and advertising director.

General offices of the corporation here also are being remodeled to accommodate increase in personnel, it is reported.

New McQuay Conditioners Are All-Year Units

MINNEAPOLIS — Featuring compact design with propeller-type, air-circulating fans, the 1937 line of unit air conditioners recently announced here by McQuay, Inc., incorporates the functions of winter heating by steam or hot water, and summer cooling and dehumidifying by direct expansion or by refrigerant-cooled brine or water, or by well water.

Heat transfer surfaces are constructed of tinned copper tubes with aluminum fins, the assembly being tested to 1,000 pounds hydraulic pressure. Manifolds are furnished in place, ready for connections by the contractor. For use with ammonia, coils with aluminum tubes are furnished.

Fans are propeller-type with heavy die-formed balanced aluminum blades, and are mounted on four-speed heavy-duty motors of standard make. All units are complete with four-speed manual controllers.

Seven air-conditioning unit model sizes are furnished, ranging from 260 to 2100 c.f.m. air delivery capacity, with motor sizes from $\frac{1}{10}$ to $\frac{3}{4}$ hp. Heat exchanger loops are furnished for direct expansion units.

With water entering at 180° F. and air entering at 60° F. heating capacity ratings given range from 20,250 to 161,920 B.t.u. per hour.

With air entering at 60° F. and steam at 2 lbs. gauge pressure, given heating capacity ratings range from 21,242 to 162,805 B.t.u. per hour.

With air entering at 85° "dry bulb" temperature and 50% relative humidity, and with entering brine or water at 35° F., the total refrigerating capacity ratings given range from 9,700 to 99,000 B.t.u. per hour.

With air entering at 85° dry bulb temperature and 50% relative humidity, and with entering brine or water at 60° F., the total refrigerating capacities given range from 4,250 to 42,200 B.t.u. per hour.

With air entering at 85° dry bulb temperature and 50% relative humidity, and with refrigerant (direct expansion) at 35° F., the total refrigerating capacity ratings given range from 8,600 to 101,600 B.t.u. per hour.

With air entering at 85° dry bulb temperature and 50% relative humidity, and with refrigerant (direct expansion) at 45°, the total refrigerating capacities given range from 7,200 to 82,650 B.t.u. per hour.

Above capacities are based upon water velocity through tubes of one f.p.s., and suction gas superheat (direct expansion units) of 8° F.

Natkin's New Tulsa Branch Does \$200,000 Business In First Few Months

TULSA, Okla.—The Tulsa branch of Natkin and Co., distributor of air-conditioning equipment with main offices in Kansas City, has made a number of good sized installations for widely varying applications of air conditioning since it was opened last Oct. 15 under the management of Bert Natkin. Value of these installations is close to \$200,000, Mr. Natkin declares.

Three 25-hp. Westinghouse condensing units have been installed in connection with the year-around installation for the United States Bureau of Mines building in Bartlesville, Okla.

Klines Dress Shop in Enid, Okla., has been equipped with an installation which includes a 5-hp. refrigerating unit and an evaporator condenser.

An unusual application is the installation of a system for the Blecker Mfg. Co., Tulsa firm which makes "Zero Bombs." A 5-hp. Carbondale machine supplies cooling for the installation. A cooling tower cuts down condensing water costs.

The 10-story Kennedy office building in Tulsa, which has 177,000 square feet of floor area, is being conditioned with a 360-ton Westinghouse steam-jet installation.

The installation for the Tower Theater in Oklahoma City incorporates the use of three 25-hp. Westinghouse condensing units. Evaporative condensers are also used on this installation.

Two floors in the 15-story Thompson building in Tulsa are being conditioned with 25-hp. Westinghouse units, evaporative condensers again being used to cut down condensing water consumption.

Circulating cold water is being used with conditioning units on each of the two office floors to provide summer cooling in the office building in Tulsa owned and occupied by the National Supply Co. of Delaware. Two 40-hp. Westinghouse compressors supply the refrigerating effect.

10 Dayton Homes to Be Kelvinator Conditioned

DAYTON—Ball Store Fixture Co., distributor of Kelvinator air-conditioning and commercial refrigeration units, has contracted with S & S Realty Co., local builder, for the installation of complete air-conditioning systems in 10 new homes being erected here. The new homes also will contain Kelvinator refrigerators and ranges.

George Ball of the distributorship estimates that the approximate cost of equipment for each home will be \$900.

Danforth to Equip 5 Thompson Restaurants in Pittsburgh

PITTSBURGH—Danforth Co., Westinghouse refrigeration and air-conditioning distributor has been awarded the contract to install air-conditioning units in five Thompson restaurants in downtown Pittsburgh.

2,000 People Visit Omaha Kelvin Home First Week

OMAHA—Two thousand people visited the new Kelvin Home during the first week it was open for inspection, according to Earl Nesbit, president of Standard Furnace & Supply Co., who installed the home's air-conditioning equipment.

STEPPING STONE

to the big field...

You can sell this
Fairbanks-Morse
Room Cooler profitably.
Each sale strengthens your
ground floor position in
the air conditioning
business.



YOU need not increase your sales or service organization to handle this Fairbanks-Morse Room Cooler. Anyone who can install and service an electric refrigerator can install and service it. There are no water connections to make. Just back it up to an outside window, plug in on a proper electric outlet, and turn it on. That's all there is to the installation job.

Your customer gets cool clean air for his office, hotel room, shop, hospital room, or any one room in his home.

Operation is quiet. All mechanism is self-contained in an all-metal cabinet handsomely grained in dark walnut.

Get the facts—then decide!

Maybe you do not fully appreciate the

opportunity that the air conditioning business offers. Maybe you won't be interested even when you do get the facts. But it certainly is too good to let a 3-cent stamp stand between you and finding out. Write Fairbanks, Morse & Co., Dept. 4831, 900 S. Wabash Ave., Chicago, Illinois.

Fairbanks-Morse Ortho-Clime Line Is Complete

It includes a wide assortment of central station units ranging in capacity from one to twenty tons, in addition to the room cooler. Central station units are designed for installation behind partitions or at some remote point. They are conservatively rated, correctly engineered, and carefully manufactured.

FAIRBANKS-MORSE ORTHO-CLIME



AIR-CONDITIONING EQUIPMENT

Helmrich Reports Results of Tests on Various Residence Cooling Systems At Detroit Edison Research House

BY F. O. JORDAN

DETROIT — Merely applying in reverse the transmission factors commonly used in estimating the winter heating load will indicate a summer cooling load for the house which is far in excess of the actual maximum load upon the cooling equipment during any one hour. Such was the contention of George B. Helmrich, Detroit Edison's Research Engineer, in his address before the April meeting of the local section of the American Society of Refrigerating Engineers held April 9 at the offices of AIR CONDITIONING AND REFRIGERATION NEWS.

The facts and conclusions brought out by the speaker are the results of extensive tests which he has conducted over a period of several years for the Detroit Edison Co.

Tests were conducted in several representative homes in this vicinity. The bulk of the work was carried on in a nine-room, two-story frame house located in Birmingham, a suburb of Detroit.

This residence is a conventional dwelling with four rooms on the first floor, four rooms on the second floor, and one room finished in the attic. Outside walls are insulated with Cabots Quilt one inch thick. Roof is insulated with one inch of Balsam Wool. The air-distribution system is a conventional residential forced warm-air heating system, installed long before cooling the house was thought of.

Data were obtained principally by means of recording instruments, particular care being exercised to keep presence of engineers at a minimum so that the equipment would be operated in the way that it would be operated by any normal family. For this reason it was contended, the results may be accepted as being representative of normal operation, rather than as special laboratory results.

Data carefully taken on the heat flow into the building prove the maximum heat entering during one hour to be less than 75% of the load estimated by the use of conventional factors.

Mr. Helmrich explained this discrepancy by saying that the usual method of estimating loads does not take into account the "flywheel" effect of building construction or the "lag" in time required for the passage of heat through building walls and roofs.

He explained that because of this

lag effect, the peak outside load is spread over several subsequent hours of light load. During this time there is a partial reversal of heat flow within the construction. Much of the heat never enters the conditioned interior at all, but flows back into the outside air during the cooler hours of evening.

Obviously, both the spreading of the load and the reversal of flow tend to reduce the maximum load for any one hour.

The speaker declared that by taking advantage of these facts, and by maintaining inside conditions in the upper range of the "comfort zone" rather than at the optimum level, a considerable saving in equipment cost will be effected. Thus the greatest obstacle to a general acceptance of residential air conditioning is reduced.

As an additional step toward reducing the cooling load, the importance of shielding windows from sun effect by means of shades or awnings was mentioned. Such precautions generally can effect cooling load reductions of 20% to 25%, the speaker pointed out.

Various methods of cooling were tested for the purpose of determining their relative results, costs, and practicability.

The results of these allegedly impartial tests, conducted by a neutral organization solely for the purpose of learning the truth, follow:

AIR CIRCULATION BY FURNACE FAN

In the first of these tests the air was recirculated through the living quarters by the furnace fan. This results in 7½ air changes per hour, an average register velocity of 300 f.p.m., and an air movement throughout the room at the 30-inch to 60-inch level of 40 f.p.m.

Under these conditions there was a reduction in effective temperature of 1°, or a 2° drop in dry-bulb temperature. The effect upon comfort was negligible.

Next, the air was recirculated through the living quarters and the basement. It was found that comfort in the living quarters was appreciably improved only until the basement warmed up, perhaps two or three hours, but that a wet basement resulted from the moisture condensed from the air when it came in contact with the relatively cooler surfaces there.

Table No. 1—Summer Cooling in a Detroit Residence
Summary of Operating and Cost Data for Summers of 1932, 1933, 1934, 1935, and 1936

Year	1932	1933	1934	1935	1936
Cooling medium	Ice	Ice	2-Ton Refrig. Machine	2-Ton Refrig. Machine	2-Ton Refrig. Machine
Total number of degree-hours above 85° during summer	529	1,408	1,345	540	1,847
Number of days of artificial cooling	22	22	23*	14	18
Number of hours of artificial cooling	135	134	214	138	245
Number of hours of fan use only					
Outdoor air cooling	57	120	6	57	11
Recirculation	...	...	114	23	115
Total number of hours of fan use	192	254	334	218	371
Average number of cooling hours per day	6.1	6.1	9.3	9.9	13.6
Electric energy used:					
Ice water pump and fan—kwh.	94	142	...	...	...
Compressor—kwh.	...	...	437†	285†	492
Fan—kwh.	...	...	172	114	181
Total energy per year—kwh.	94	142	609*	399	673
Condensing water for compressor:					
Gallons of water per minute, average	...	...	2.07	1.4 and 2.1	...
Total water consumption for season, gallons	...	...	26,700	14,790	30,200
Cost of cooling for season:					
Ice at \$5 per ton	\$45.60	\$30.60	...	...	...
Electricity at 2½ cents per kwh.	\$2.12	\$3.20	\$13.71	\$9.00	\$15.15
Condensing water at 20 cents per M. gal.	...	...	\$5.34	\$2.96	\$6.04
Total operating cost	\$47.72	\$33.80	\$19.05*	\$11.96	\$21.19
Average cost per day of artificial cooling	\$2.16	\$1.54	\$0.83	\$0.85	\$1.17
Average cost per hour of artificial cooling	\$0.35	\$0.25	\$0.089	\$0.087	\$0.086

Refrigerant—Freon.

Two-cylinder compressor.

Two-horsepower motor—220 volt, single phase repulsion induction.

1934—compressor speed 400 r.p.m.

In 1935 the machine was operated at 1½-ton capacity (290 r.p.m.) during first half of season (63 hr.), and at 2½-ton capacity (500 r.p.m.) during last half (75 hr.).

*Corrected for five cooling days in June when machine was not available.

†Power required by compressor, full load—2.04 kw.

‡Power required by compressor, full load—63 hr. at 1.56 kw.—75 hr. at 2.64 kw. (Average for test days only.)

AIR CIRCULATION BY ATTIC EXHAUST FANS

In attic fan tests, the air was drawn in through second story bedrooms and up the stairway into the attic by an exhaust fan which discharged the air outside.

It was found that the bedroom temperature can be lowered to a level 8° above the outside temperature if the air flow through the room equals 15 complete air changes, while air changes upward of 30 through the bedroom will lower its temperature to a point 2° above outside temperature. The benefit derived depends upon the outside temperature, so that this method of cooling is effective only during relatively cool nights.

COOLING BY ICE

For tests on cooling the residence with ice a 1,000 gallon tank was buried outside the basement and extended fin-type cooling surfaces were installed in the cold air intake to the furnace. A pump circulated the water from the tank through the coil. Air was drawn through the coil by the furnace fan and distributed through the building by the duct system, with room supply registers in the baseboards.

It was found necessary to melt about 1,000 pounds of ice at a cost of \$2.50 in four hours to reduce room conditions to the comfort zone. Outside air stood at 95°—100°.

The principal objections to this method were the high operating cost and the difficulty in guessing in the morning whether the day would be hot enough to justify the expenditure. After ordering ice and having the day turn cool, at a waste of \$2.50, the occupants became reluctant to order ice at all.

COOLING BY WELL WATER

During the well water tests, the same equipment was used as described above, except that water was taken at about 57° from the city mains. The Birmingham system is supplied with well water at normal (or below normal) well water temperatures.

The results obtained by well water at temperatures below 60° proved satisfactory, except that the operating cost for city water was high. However, these costs should not differ greatly from those encountered in drilling and pumping from a well.

COOLING BY MECHANICAL REFRIGERATION

In cooling by mechanical refrigeration, a direct-expansion extended-fin heat-transfer surface cooling and dehumidifying unit was installed in the air intake to the furnace. This location formerly was occupied by the cooling surface used with the ice water and well-water systems. A 2-hp. mechanical refrigerating unit was installed.

With this method of cooling, the results obtained were "perfect." Comfort conditions were readily maintained during severe summer weather, while the cooling effect was

at the immediate disposal of the occupants merely by snapping a switch on or off.

It was stated that even during the record-breaking week of 1936 when temperature rose to 106° F. and stayed above 100° F. every day, the maximum first floor temperature was 80°, while the highest upstairs temperature was less than 83° F.

Operating cost was said to be quite favorable when compared with the operating costs of other effective methods of cooling, but the first cost of mechanical refrigeration was declared to be its worst handicap. The latter had to be appreciably reduced through production methods, through improved design, by considering heat "lag," and by basing design upon inside conditions at the upper limits of comfort as explained above.

It was found that under favorable outside conditions, the operating

time of the refrigerating equipment could be reduced by 15% or 20% by cooling the house through operation of the attic exhaust fan during the previous night. However, the economic justification of this feature was questioned by Mr. Helmrich, as it seemed doubtful to him whether the saving in overall operating costs justified the expenditure of \$100 to \$125 for the attic exhaust equipment.

The operating costs of this 2-hp. mechanical refrigeration system were shown to be in the neighborhood of 10 cents per hour, or \$20 per season.

Figures were cited which indicate that at an operating time of 200 hours per season, the annual costs of the mechanical system and the system using ice are about the same when both operating costs and fixed charges are considered. In localities where operating time is in excess of

(Concluded on Page 19, Column 1)

AERO SELF-ALIGNING SEALS

Seat and Seal Immediately



LIKE A BICYCLE SADDLE!

EVERY SEAL GUARANTEED

COVERED BY U.S. PATENT
2,067,540
OTHER PATENTS PENDING

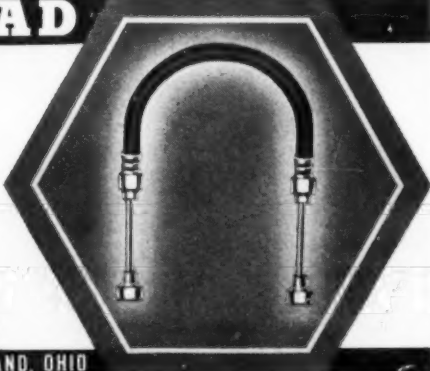
AERO PRODUCTS CORPORATION
36-52-36th St., Long Island City, New York

WEATHERHEAD CHARGING HOSE

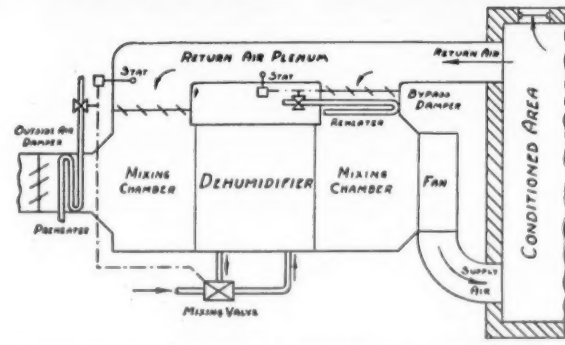
- Flexible conductors for all refrigerants.
- Complete range of sizes and lengths.
- Six inches of copper tube at each end.

GENUINE WEATHERHEAD REFRIGERATION PARTS

WEATHERHEAD • 300 E. 131 ST. • CLEVELAND, OHIO



AN AIR CONDITIONING SYSTEM OF UNIVERSAL APPLICATION.



AUDITORIUM Conditioning Corporation in this and succeeding months will bring to your attention outstanding types of air conditioning systems (*) for HUMAN COMFORT.

The system illustrated is found in most of the prominent air conditioning installations in the world. Leading architects and engineers consider it STANDARD. Its pre-eminence is based upon outstanding features, among which are—

- ✓ Maximum efficiency and economy under all load conditions.
- ✓ Speedy cooling down.
- ✓ Simplicity and flexibility of control.
- ✓ Temperature and humidity always as desired regardless of occupancy or load.
- ✓ An ample supply of fresh air for ventilation requirements.
- ✓ No streaks or drafts.
- ✓ Year 'round operation—summer and winter.

Our Licensees will be glad to consult with you regarding the engineering features of this system and also tell you about many other Auditorium Systems. (*)

American Blower Corp.
Detroit, Mich.

J. O. Ross Engineering Corp.
New York, N. Y.

Buffalo Forge Co.
Buffalo, N. Y.

Carrier Corp.
Newark, N. J.

Frick Co.
Waynesboro, Pa.

General Electric Co.
Schenectady, N. Y.

The Cooling & Air Conditioning Corp.
Division of E. F. Sturtevant Co.
Hyde Park, Boston, Mass.

York Ice Machinery Corp.
York, Pa.

(*) Auditorium Air Conditioning Systems are covered by many issued patents and pending applications.

AUDITORIUM CONDITIONING CORPORATION

New York Office—17 EAST 42nd STREET

Summer Cooling with Mechanical System Cheaper Than with Ice, Helmrich Says

(Concluded from Page 18, Column 5)

200 hours per season, the annual cost favors the mechanical system. The speaker cited the opinion that the home owner and the industrial corporation look at costs from somewhat different angles. The corporation cost accountant considers amortization as well as operating costs; the house owner, after the equipment has once been paid for, deems first cost a thing of the past and tends to consider only how far down he must dig into his pocket to meet current expenses.

Obviously, this hand-to-mouth tendency to live for the moment of the average homeowner favors the lower operating cost of the mechanically cooled air-conditioning system. However, the speaker stated, the first and operating costs of the air-conditioning system in the uninsulated residence are so high that the air conditioning of this class of home is not warranted.

In closing, Mr. Helmrich summarized his speech as follows:

"It is feasible to cool a moderate sized residence with a 2-ton refrigerating machine (1) if the climate is similar to that prevailing in the Detroit area, (2) if the residence is well insulated, and (3) if its windows are protected against sun effect.

"A 2-ton machine is the smallest size which will perform satisfactorily under the above conditions in a residence of a size equivalent to that of the Detroit Edison Research Residence.

"Natural infiltration will provide sufficient outdoor air for the ventilating requirements of a residence under normal conditions of occupancy. It is not necessary to add to the cooling load by providing a supply of outdoor air.

"The controls for a residence cooling system need consists only of a set of conveniently located push-buttons for starting and stopping the compressor.

"Only in installations were the refrigerating capacity is considerably in excess of cooling requirements is a room thermostat really required. The compressor itself should, of course, be protected against failure of cooling water supply by a high-pressure cutout.

"Even though we assume that a 2-ton mechanical cooling system will cost about \$200 more than an ice system, and should therefore be burdened with an extra fixed charge of 15% of \$200, or \$30 per year, the total annual cost of the mechanical system is less than that of the ice system for a rather small number of hours of use (ice costs \$5 per ton).

"This is demonstrated by comparing the mechanical cost of 1935 with the ice-cooling costs of 1932 when weather conditions were similar and the hours of use were about 135 in each case (see Table No. 1).

"The present average cost of installing either an ice or a mechanical cooling system in a residence is rather high, and seems out of proportion to the number of days it will be used in summer seasons such as Detroit's.

"Fixed charges are three to four times as high as operating charges. A reduction in the first cost of the cooling equipment will greatly enlarge the field for residential cooling.

"The number of hours and days that artificial cooling is required in a well-insulated residence is much less than has been generally estimated. In a climate like that prevailing in Detroit this figure will probably not exceed 250 hours, or 30 days for the warmest summers, and for normal summers will probably not exceed 200 hours, or 20 days."

The test results given in Table No. 1 are shown for the purpose of comparing ice cooled and mechanical refrigeration air-conditioning systems.

Chase to Manage Gar Wood Rochester Branch

DETROIT—Stanley E. Chase, for the past four years in the sales department of the air-conditioning division of Gar Wood Industries, Inc., has been appointed manager of the company's air-conditioning division branch in Rochester, N. Y., according to Frank H. Dewey, general manager.

S. T. Smith, formerly manager at Rochester, has been transferred to the management of the company's Boston branch, succeeding E. H. Band, who is no longer with Gar Wood Industries.

Delco-Frigidaire Plans Extensive Campaign of Magazine Advertising

DAYTON—Through national advertising to be run in consumer and business magazines, Delco-Frigidaire, air-conditioning division of General Motors Corp., plans to reach approximately 175,000,000 subscriber-readers in an effort to tap existent and potential markets for automatic heating equipment, air-conditioning equipment, and room cooler unit sales this year, according to James J. Nance, general sales manager.

Preparatory to launching this energetic promotional campaign, executives of Delco-Frigidaire, headed by Mr. Nance, C. J. Bachman, sales manager, O. E. Wolf, sales planning manager, and C. E. Lewis, chief sales engineer, outlined the 1937 sales plans for distributors, dealers, and salesmen at meetings held in key cities throughout the country.

"Sixty per cent of the automatic heating equipment sales in 1936 were made to buyers with incomes between \$1,800 and \$4,500 a year," Mr. Nance declared. "We estimate that 1,000 automatic heating equipment sales a day will be made in 1937, of which 150 to 200 will be for homes to be built this year."

"Of this number," Mr. Nance added, "500 to 700 of the daily purchases will be to buyers who are converting their shovel-fired plants to automatic heating units. Approximately 100 per day will replace obsolete automatic heating plants with new equipment."

"It pays to talk to Delco-Frigidaire first" is the slogan being featured in all insertions of the national advertising program which was inaugurated during the latter part of March.

Headed by *Saturday Evening Post* and *Time* magazines, the national publications selected to carry the

Delco-Frigidaire message in this 12-month campaign include:

Architectural Forum, Pencil Points, American Architect, Architectural Record, American Home, House Beautiful, House and Garden, Town and Country, American Builder, and Practical Builder.

Brey Named Chief Engineer Of Atmospheric Control Co.

DETROIT—John Brey, formerly in the Philadelphia office of Carrier Corp., has joined the staff of Atmospheric Control Co., Detroit Carrier distributor, as chief engineer.

He began his experience in the refrigeration field in 1926, when he joined the Brunswick-Kroeschell organization in the contract engineering department of the company's Brunswick, N. J., plant, working on both domestic and export commercial refrigeration systems.

Later he spent three years in the company's marine department, working on ship refrigeration installations.

When Brunswick and Carrier merged in 1931, Mr. Brey was transferred to the Carrier home office in Newark, and two years later went to the Philadelphia office, where he combined his refrigeration and air conditioning experience, supervising installations in the field.

Mr. Brey has made a specialty of low temperature air-conditioning installations for meat packing, food industries, and breweries.

Joplin Hotel Has Lobbies & Dining Rooms Conditioned

JOPLIN, Mo.—Lobbies and dining rooms of Connor Hotel will soon be air conditioned, according to Manager J. W. Wyckoff. Installation plans may be extended to include guest rooms and other divisions of the hotel.

34 Utility Employees Enrolled In Air Conditioning Course

NEWARK—Thirty-four employees of Public Service Corp. of New Jersey have enrolled in a course in heating and air conditioning, conducted under the general supervision of the utility's committee on educational work.

H. Preston Morehouse, Public Service Corp.'s general air-conditioning representative, is instructor. Classes are held weekly in the Newark Terminal building.

Miniature Conditioned Home Built by Gar Wood, Inc.

DETROIT—A miniature model home, an exact, scaled-down duplicate of a residence actually under construction, has been completed by the air-conditioning division of Gar Wood Industries, Inc., to show the method by which a modern home is automatically heated and air conditioned, according to Frank H. Dewey, manager.

Basement of the model home contains a diminutive Gar Wood Tempered-Aire unit, and a complete Airdux system distributes the air. Details of the system's installation and operation are readily discernible, Mr. Dewey says.

Newstrom-Davis to Handle Carrier in Rocky Mt. Area

DENVER—Newstrom-Davis, contracting firm, has been appointed distributor of Airtemp air-conditioning equipment in the Rocky Mountain area. A retail branch has been opened, and addition of lines of domestic and commercial refrigeration equipment is planned.

Managing the retail branch is E. L. Smith, formerly Wisconsin field manager for Petroleum Heat & Power Co.

Reasons Why Wagner Motors

Are Preferred for Refrigeration and Air-Conditioning Equipment

1 They are reliable. All motor parts and completed motors are carefully tested to meet exacting specifications according to the highest electric motor standards—an assurance to users that Wagner motors are reliable, free from defects and will last a good long time if properly used.

2 They are economical. Actual tests show that Wagner motors consume very little electric current, do not require much care, and operate smoothly and easily under all types of load conditions.

3 They will give satisfactory service. Wagner motors of today are the result of constant improvement in their mechanical design and efficiency, gained by 45 years of experience in building and designing motors for industry and the home. These years of experience have enabled Wagner's engineers to determine the characteristics of motors that are best for satisfactory service.

4 They can stand rough treatment. Wagner motors have rolled-steel frames—strong, rigid—will not get out of alignment—unbreakable.

5 They require very little attention. The life of motors depends upon the condition of operation to which they are subjected and the care they receive. Wagner motors are so constructed that wear between moving parts is reduced to a minimum. In addition, Wagner motors are equipped with large oil wells and have special lubrication systems so that only periodic oiling is necessary.

6 They are well-designed. Due to precision of manufacture, careful selection of materials and parts, and intelligent engineering, Wagner motors have all the features that contribute to efficiency, and yet are unusually compact in design.

7 Convenient service facilities. Wagner maintains 25 branch offices, warehouses, and service stations in all parts of the country. Each branch carries a complete stock of parts available for immediate shipment. Thus, when there's trouble with any type of motor, Wagner can give better and quicker service.

The above are just a few of the many reasons why Wagner motors are preferred. Many motor buyers prefer Wagner motors because they know that the Wagner line is so diversified in types and ratings that they can get, without special designing, exactly the right motor for their job. Others prefer Wagner motors because they like the cooperation and helpful assistance the Wagner sales-engineers give them when solving their power-drive problems.

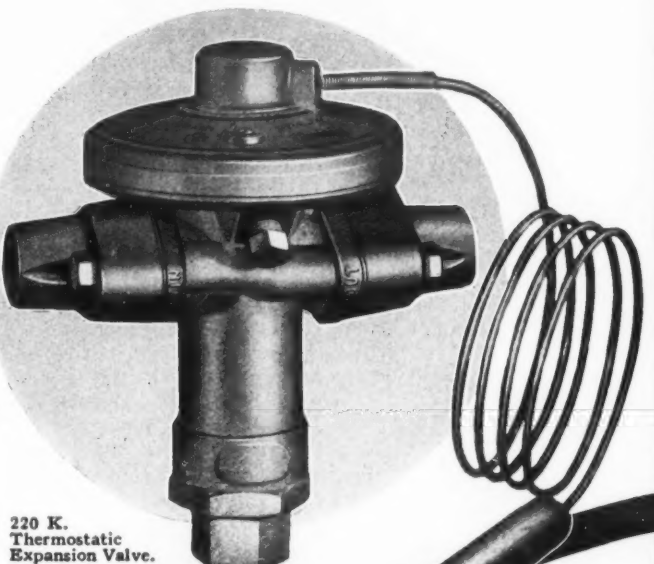
When considering your next motor application or installation problem, avail yourself of Wagner's service. Wagner engineers will be glad to work with you and help you select the correct motor for your job. Descriptive literature will be sent upon request.

MS 137-1M

Wagner Electric Corporation

6400 Plymouth Avenue, Saint Louis, U.S.A.

MOTORS • TRANSFORMERS • FANS • BRAKES



220 K.
Thermostatic
Expansion Valve.



A-P Expansion Valves are easy to disassemble and clean

There are many sound reasons for the great popularity of A-P Expansion Valves. But the one big factor is PERFORMANCE. A-P expansion valves save trouble. They go right on doing their job day after day and year after year.

This is primarily because of the diaphragm principle of construction pioneered by A-P engineers, which permits a full liquid-filled power element. The vital operating parts are built with micrometric precision and housed in forged brass bodies to eliminate possible leakage through the metal. The power element and the system are likewise made leakproof.

The improved principle, the selected materials used, the precision manufacture and the critical testing and inspection combine to produce a valve in which the service cost is reduced to the vanishing point.

A-P Expansion Valves are available in a full range of sizes up to 15 tons Freon capacity, and for all modern low-pressure refrigerants.

Progressive Jobbers everywhere stock A-P Controls.

Built Right from the Inside Out

Each part of an A-P Expansion Valve is designed and built to produce a perfectly working unit. All working parts are easily removed for inspection and cleaning.



AUTOMATIC PRODUCTS COMPANY

2450 NORTH THIRTY-SECOND STREET

MILWAUKEE



WISCONSIN

Air Conditioning in Detroit Packing Concern's Slaughter House Solves Many Types of Cooling Problems

BY F. O. JORDAN

DETROIT—Air conditioning recently installed and placed in operation in the American Packing Co.'s slaughter house for Louis Fineman is featured by the unusual application of low-temperature air-conditioning for process purposes. It includes some effects which are declared to have eliminated many difficulties generally considered to be inseparable from slaughter house work.

The system, which is the first fully automatic installation of its type to be made in Detroit, is the result of the combined efforts and experience of the sales and engineering departments of the Atmospheric Control Co., Detroit representative for the Carrier Corp., particularly of H. C. LeVine, president, John Brey, chief engineer, and Harvey Beggs, commercial salesman.

COOLING FOR THREE ZONES

The slaughter house normally handles 250 cattle per week. Refrigeration is provided for three zones; chill cooler, sales cooler, and freezer. Separate air-conditioning systems, both served by one refrigeration machine, are provided for the chill cooler and sales cooler, while a separate refrigeration machine is installed for the freezer, with galvanized welded direct expansion coils in the freezing room. Ammonia is the refrigerant used in the system.

For refrigerating his plant, the owner had four alternatives: ice, pipe coils with gravity air circulation; pipe coils with auxiliary air-circulating fans located in the coolers, and a complete air-conditioning system.

For so large an installation ice was considered out of the question for obvious reasons hinging upon operating cost, inconvenience, temperatures required, lack of humidity control, etc.

OBJECTION TO PIPE COILS

Objections to pipe coils were held to be as follows:

a. Difficulty of obtaining uniform temperatures over entire space.

b. Stagnation of air tending toward odors and toward condensation, mold, and slime on walls and surfaces.

c. Low refrigerant temperatures used to counteract low heat absorption of coils with gravity air circulation resulting in drying out of air which in turn effects costly meat shrinkage and deterioration of product.

d. Low temperature coils frequently must be cut out of service for defrosting, and for de-icing by arduous handwork. During such periods there is an absence of refrigeration.

The air conditioning as installed was decided upon for the following reasons:

WHY IT WAS INSTALLED

a. Uniform temperatures, humidities and air motion assured.

b. Elimination of stagnant odors, and of condensation, mold and slime by air movement over entire cooler.

c. High heat transfer due to high face air velocity through coils in air-conditioning units, even at moderately high refrigerant temperatures, allows use of higher refrigerant temperatures which do not result in undesirable drying of air which usually accompanies high rate of dehumidification.

d. No defrosting nor de-icing necessary due to high refrigerant temperatures used.

e. Constant attention avoided and uniform conditions maintained by fully automatic operation.

f. Much more rapid cooling of carcasses without undesirable drying and product shrinkage and deterioration.

BANISHING 'FOG'

Upon being slaughtered and washed, the carcasses are brought in a hot wet condition into the chill cooler. Here the problem is rapid product cooling, and prevention of sweat, mold, and fog due to the rapid evaporation of the washing water from the product.

The problem of avoiding low humidities is not serious here because of the wet condition of the product, and to the comparatively short duration of its presence in the chill cooler.

For conditioning the chill cooler, a dry surface-type Carrier air conditioner is installed in the space above the cooler, supplying air to the cooler through an overhead opening at the end of the cooler farthest from the product-receiving end. The air is circulated from the chill cooler through an overhead opening above the product-receiving end, so that the fog rising from the warmest and wettest carcasses is removed immediately.

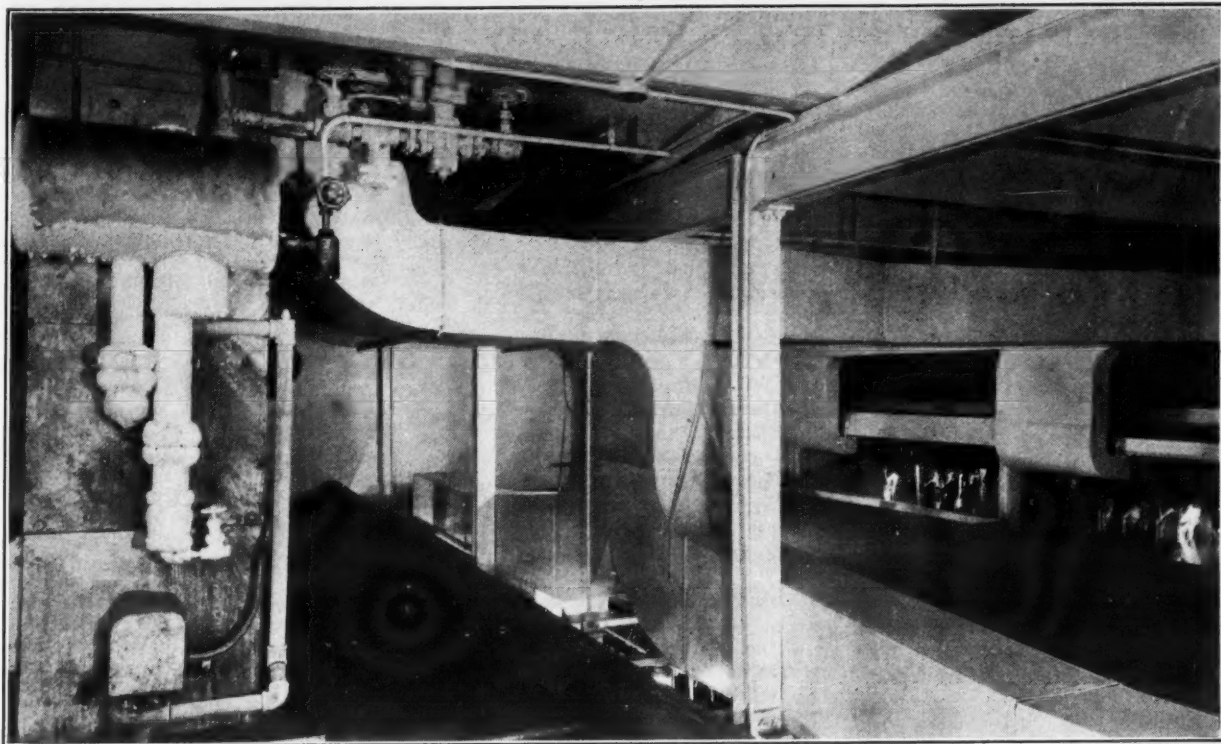
Thus the existence of fog is limited to a negligible amount at the receiving end of the chill cooler. Fog is removed rapidly and condensed from the air by the air-conditioning coil. At no time can moisture be felt upon the walls. Odors are held at a minimum.

COOLING TIME REDUCED

The installation of air conditioning has reduced the cooling time from 24 hours to 18 hours in the chill cooler.

The equipment for the chill cooler is designed to maintain a 44° dry-bulb

Process Conditioning Solves Humidity Problem in Packing Plant



Model 15T7 Carrier Cold Diffuser and accompanying duct work installed by Atmospheric Control Co. in the plant of the American Packing Co., Detroit. This system serves the sales cooler unit, where the dressed meat is to be kept at a temperature of 34° F. with as little loss of moisture as possible. The Cold Diffuser unit, which is of the brine-spray type, was installed in space originally designed for bunkers of coils.

temperature within the cooler, but the room thermostat allows operation of the conditioner until the room temperature has fallen to 36° F. because of the decrease of the refrigeration load as the temperature of the product is reduced.

Since this reduction in load results in a lowering of the refrigerant temperature to a level at which some frosting of the coils occurs, a defrosting thermostat is installed on the coil surface which cuts off operation when the surface temperature falls to 32°.

Resultant off-cycles for defrosting are not objectionable for the chill cooler, as they are of brief duration only, and can occur only when the room temperature is considerably below the desired design temperature of 44° F.

SOLENOID-OPERATED VALVES

Both the room thermostat and the defrosting thermostat control the refrigerating effect of the air conditioner by means of a solenoid operated shut-off valve located in the refrigerant suction line, the refrigerant feed being by means of a low pressure float valve with refrigerant surge tank.

For conditioning the sales cooler, a Carrier brine spray type conditioner is used.

In this unit the air cooling and dew point control is accomplished by an up-draft direct-expansion fin-and-tube cooling surface over which brine is sprayed downward from above to insure intimate contact between brine and air, and accurate dew point control. The brine is collected in a tank below the cooling coil, and recirculated through the sprays by a pump.

HOW CONTROLS WORK

The room thermostat controlling

this unit operates a combination suction pressure-regulating and solenoid shut-off-valve installed in the suction line. When the room temperature falls below 34° the valve closes and stops the refrigerating effect of the conditioner.

When the room temperature is above the setting of the thermostat, the suction valve acts as an automatic suction pressure regulator, to prevent the refrigerant temperature in the coil from falling below a temperature at which too rapid drying of the air would result from too high a rate of dehumidification.

In this way, the shrinkage of the product is said to be held in the neighborhood of 2½% to 3%, a figure claimed to be much below the shrinkage commonly encountered in the conventional cooler.

CONDITIONS FOR SALES COOLER

For the sales cooler unit, the operating conditions are as follows:

Refrigerant temperature in coil 22° F.

Coil surface and brine spray temperature 25° F.

Outlet air condition 29° DB and 90° RH.

Air velocity throughout room 10-20 f.p.m.

Room condition 34° DB and 87° RH.

This conditioner is located in a space above the cooler and supplies the air through overhead distributing ducts and horizontally discharging openings located overhead. The air is recirculated directly from the upper portion of the cooler.

The refrigerant feed is through a low pressure float, and a surge tank is installed of sufficient capacity to prevent "flood-back" to the compressor.

The refrigerating machines are located in the basement, and are Carrier-Brunswick non-oil pumping type, driven by Wagner motors with Cutler-Hammer starters. The Carrier condenser is shell-and-tube type while compressor controls are manufactured by Mercoid.

WATER CONTROL PROVIDED

A head pressure or water control valve is provided for regulating head pressures, while a high pressure safety cutout is provided for stopping operation in case of excessive head pressures at compressors or condenser due to condensing water failure or other cause.

A low pressure control is provided for stopping the compressor motor upon falling suction pressures due to stoppage of both air-conditioning units in the case of the large compressor, or of the freezer cooling coils in the case of the small compressor.

The motor for the compressor which operates with the air-conditioning units is a 15-hp. constant-speed motor, while a 3-hp. constant-speed motor is used with the compressor serving the freezer coils.

FREEZER COIL CONTROL

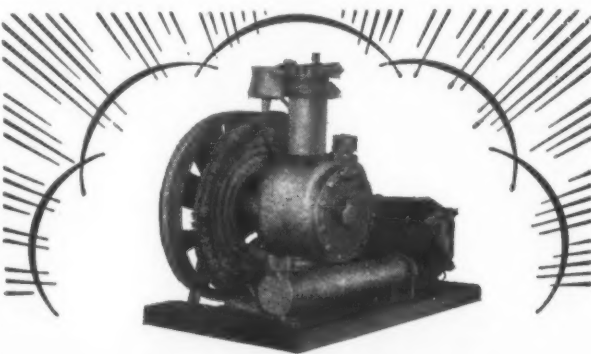
The control of the freezer coils is through a room thermostat set at 10° F. operating a solenoid operated shut-off valve in the liquid refrigerant supply to the coils.

Operation of the system and the results obtained by its use are declared by the owner to be most satisfactory, as the results include quicker cooling, reduced product shrinkage, improved quality of product, decrease in attention required by equipment, elimination of labor, and other undesirable features of extended de-icing and de-frosting periods.

INSURANCE without paying a PREMIUM



ANSUL CHEMICAL COMPANY
MARINETTE WISCONSIN



20 Acres of Plant Facilities



CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Co.
1912 KIENLEN AVENUE ST. LOUIS, MO.

Represented in Canada by
Canadian Curtis Refrigeration Co., Ltd.
20 George St., Hamilton, Ontario

IT STILL RUNS—after fifteen years. And you can still get parts for it.

IN 1922 Curtis introduced this condensing unit — a pioneer in the field. So well was the unit designed and built that even today it provides dependable refrigeration.

And parts and service are still available.

The engineering skill and resources which make such records possible are behind the Curtis condensing units of today.

A Curtis unit represents the soundest design principles evolved from 15 years of condensing unit development and pioneering — plus the sponsorship of an 83-year-old organization with ample financial resources to assure that your unit will never be an orphan.

86 condensing units comprise the Curtis line — with both air and water-cooled models. Sizes 1/6 HP to 30 HP. Write for specifications.

CURTIS

General Electric Adds New Models to Water, Beverage, & Milk Cooler Lines

(Concluded from Page 1, Column 4) connection to local water supply, is the same as BM-11 except for a flat top panel and water intake. It may be converted from one type to another, should occasion require, and is available for either a.c. or d.c. current.

Model RM-12, the bubbler type, resembles RM-11 except for a bubble top with basin and a plain front panel. It, too, may be converted into either of the other two types, on demand.

The coolers will handle a full 3½ gallons of water per hour, cooling from 80 to 50° F. They have a 1-gallon reserve storage capacity.

Designed by Ray Patten, the new G-E coolers have a Sudan bronze Glyptal enamel finish. Features include a specially designed two-cylinder refrigerating unit, using Freon-12; Upon high-efficiency fan; rubber cushion unit support; G-E capacitor motor; heat interchanger to cool refrigerant; provision for remote installation; and anchored water-line connections.

The units are only 14 inches square, and have a recessed toe space to prevent scuffing, with all-steel "skyscraper" construction and seamless "Inter-Lock-Tite" panels. Insulation is sealed in steel, and the cooling chamber is lined with stainless steel. Bubbler is one-piece, and water receptacle is of vitreous enamel.

Addition of the three new units raises to 12 the number of models in the G-E water-cooler line, including the heavy-duty models for industrial use. The new coolers are designed for use in offices, stores, schools, libraries, banks, and other places where water-cooling requirements do not warrant installation of a larger unit.

G-E's new electric beverage cooler, also styled by Ray Patten, is in the modern manner, with cardinal red color motif and stainless steel trim.

The unit is 37¼ inches high, 44½ inches wide, and 25½ inches deep, and has a capacity up to 150 bottles of 6-ounce size. Cooling capacity per hour is up to 56 bottles, depending on room temperatures.

Designed for use in drug and grocery stores, filling stations, food markets, lunch rooms, bus stations, recreation halls, roadside stands, taverns, and similar places, the cooler has a twin-cylinder condensing unit, temperature control, table top claimed not to wobble, gliding openers, a sliding rail of chrome-plated zinc, and all-steel cabinet with box channel steel supports and cross-bars.

Finish is of acid-resisting "Synflo" enamel, and there are automobile type louvers for extra ventilation. Cooling coil is of seamless copper tubing.

A bubbler accessory for drinking water is available on the beverage cooler at slight additional cost, and is a desirable addition for filling stations and other locations where drinking water is frequently made available as an extra service. Water-cooling capacity is from 1 to 5 gallons per hour, depending on room and water temperature.

The cooler may be had also with a dry storage compartment for bottles, packaged cheese, eggs, sandwich materials, etc. Dry storage capacity is up to 60 bottles, or the bulk equivalent. On this unit, tank storage capacity is up to 100 bottles.

Milk-cooler line includes a wide choice of units in wet or dry storage models in various sizes, equipped with ice maker, if desired. Special emphasis is being placed on the self-contained models, equipped with deck-mounted G-E refrigeration units ready to plug in and operate, for either wet or dry storage.

G-E's new "Scotch Giant" refrigerating machine, featured in the new milk coolers, is a twin-cylinder unit available in either ¼ or ½-hp. rating, using Freon-12 as the refrigerant.

Other features of the cooler line include all-steel cabinet and inner and outer tanks, sealed-in-steel insulation, seamless copper cooling coil

with welded steel rack, clamp-tite steel top, extra-large overflow pipe, and a four-coat special exterior finish.

"Walk-in" coolers for bulk milk, bottle milk, meat, fruit, vegetables, eggs, or general storage are available also in sizes to meet all requirements.

G-E's "Spinner" finned cooling units, in sizes to fit all cooling requirements, are being manufactured by Peerless of America, Inc., and were described in the March 10 issue of AIR CONDITIONING AND REFRIGERATION NEWS.

Construction features include rifled tubing, which causes the refrigerant to whirl as it passes through, increasing its velocity and causing it to cover more surface; open coil construction, aluminum fins with corner locking, individual pinch-locked fins, and crimped tubing.

The new booklet for food store operators contains 32 pages of charts, statistics, and up-to-date information about the food sales market.

The answers which use of General Electric commercial refrigeration equipment can help the merchant give to such perplexing questions as: "How Can I Get More Customers?" "How Can I Get More Business Per Customer?" "How Can I Reduce Operating Expenses?" "How Can I Increase My Net Profit?" "How Does Mrs. Housewife Divide Her Food Dollar?" "When Is Produce Selling Most Valuable?" and others, form the backbone of the booklet, which will tell G-E's commercial story to merchant-prospects.

Gloekler Introduces New Ice Maker

PITTSBURGH—A Twenty Pound Ice Maker, with freezing capacity of eight 32-cube trays, has been introduced by Gloekler Mfg. Co., producers of commercial refrigerator cabinets and display cases, for use in cocktail bars, clubs, and institutions, according to Karl J. Gloekler, manager, refrigerator division.

Overall dimensions of the box are: 44 inches high, 26 inches wide, and 24 inches deep. Compartment for the condensing unit, located at the bottom of the box, measures 16½ inches high, 20 inches wide, and 20 inches deep. This compartment is closed by a removable panel.

Walls, top, and bottom of the unit are 4 inches thick, and the entire box is lined with galvanized iron. Dulux finish is used on the exterior, but the panel surrounding the ice trays is finished with porcelain enamel.

Company officials claim that a ¼-hp. condensing unit will provide approximately five to six freezings every 24 hours.



Nine Distinct Services from



Sharp and Dohme, pharmaceutical chemists whose 9-story plant in Philadelphia is a block long, have used a 100-ton automatic Frick Refrigerating System since 1931—for conditioning air, making ice, cooling drinking water, condensing distillates, freezing waxes, chilling elixirs, hardening gelatine, making insulin, and storing serums worth millions of dollars.

Whatever the needs of the customer, they can always be met with Frick Refrigeration. Machines for ammonia, Freon-12, methyl chloride and carbon dioxide, in all commercial types and sizes. A world-wide organization, with unequalled experience, awaits your service.



Tyler Sales Fixtures Installed In Three Detroit Markets

DETROIT—Of the recent commercial refrigeration installations made by All Metal Store Equipment Co., representative of Tyler sales fixtures, three typical ones are those placed in grocery and meat markets.

An all-green installation consisting of two 8-ft. display cases operating on a ¾-hp. Brunner condensing unit was made in W. C. Joyce's market, 2529 Woodmere.

Connected to a 1-hp. Brunner machine, two 10-ft. Tyler top display cases and a 6-ft. Tyler dairy counter were installed in Bauman's Market, Helen at E. Lafayette.

A combination of an 8-ft. top display case and an 8-ft. double-duty display case operating on a 1-hp. Brunner refrigerating unit was placed in the Birmingham Economy Market, Birmingham, Mich.

Freez-Master Designs Portable Freezer

BELOIT, Wis.—A completely portable one-gallon freezer, designed primarily as a malted milk or soft ice-cream machine but also capable of freezing regular ice-cream, has been placed on the market by the Freez-Master Co. here.

The new unit is 51 inches high and less than 2 ft. square, including base and top. All mechanism, including freezer and compressor, is in the center section, so the unit may be operated without the base if desired. No installation is required, for the unit is simply placed in the store and plugged into the nearest socket.

Base and top of the freezer are red. Center unit is white.

Freez-Master has made arrangements for purchasers of its unit to obtain a powdered mix enabling them to make malted milks for 36 cents a gallon.

Refrigerated Lockers Give Meat Dealers 2-Way Profit

LYNDEN, Wash.—By renting individual refrigeration lockers to its customers, City Meat Market is selling meat in larger units (hence more meat) and collecting locker fees at the same time.

Consumer benefits of the plan extend not only to the purchasing housewife but to producers of vegetables, eggs, poultry, and other meat products as well. The former can buy meat at reduced rates, the latter can store perishable products.

Capacity of the lockers is reported to be 300 lbs. of meat and rental fees 75 cents a month, \$3.50 for six months, and \$6 a year.

Temprite Eliminates Price Differences by Refrigerants

DETROIT—No price distinction between beer and water-cooling units using either sulphur dioxide, methyl chloride, or Freon-12 as the refrigerant is made in Temprite Products Corp.'s new price schedule, which became effective April 1.

Increased production of methyl chloride and Freon-12 units has made possible elimination of the price difference which formerly existed between the refrigerants, Sales Manager H. B. McLaughlin said in a letter accompanying the new price list to distributors.

Cincinnati Lipman Outlet Redecorates Quarters

CINCINNATI—Refrigeration Equipment Co., distributor of General Refrigeration Sales Co.'s Lipman equipment in this territory, has just completed redecorating and rearranging its display rooms and offices.

Carrier Commercial Systems Used on Pacific Air Bases

HONOLULU, Hawaii—Specially designed Carrier commercial refrigeration equipment installed on the islands of Midway, Wake, and Guam, operating bases of Pan-American Airways' recently established trans-Pacific route, has made possible a 3,500-mile milk route through which government and air-line employees living on these islands receive regular shipments of fresh Hawaiian milk.

Refrigeration equipment was manufactured in Carrier Corp.'s New Brunswick, N. J., plant, and delivered to the islands in a chartered ship. It was specially designed to cool and preserve dairy products, meat, vegetables, and other perishables needed by the island inhabitants and the crews and passengers of Pan-American planes.

Dairymen's Association, Ltd., of Honolulu arranged to supply the necessary milk for delivery to the islands by the air line's clipper ships. Before inauguration of the new milk route, islanders depended on powdered milk.

Super-Cold to Introduce 17-Ft. Commercial Box

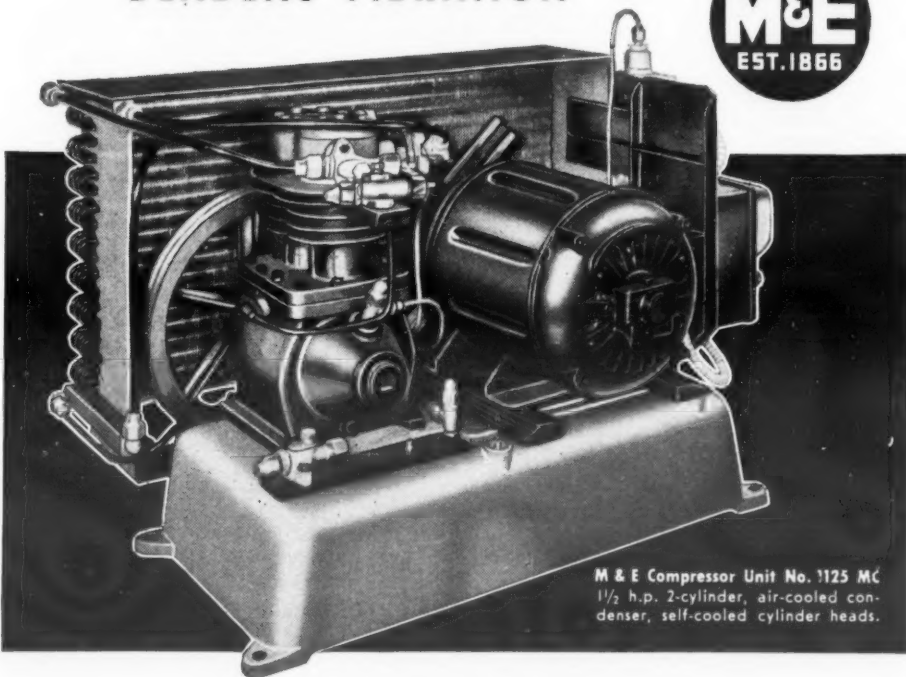
LOS ANGELES—Super-Cold Corp. will have ready for distribution soon a small commercial refrigerator with 17-cu. ft. net storage space, priced at around \$295, and available with evaporators, the same as in display cases, or with an ice maker of commercial size.

The refrigerator will be 6 feet 6 inches high, 30 inches deep, and 36 inches wide, with two doors (one over the other), and the condensing unit located near the floor.

Design will be streamlined, with chrome trim finished in white Dulux on pressed board. Interior will be metal, finished with baked Dulux.

THE RUGGED, ONE-PIECE CAST BASE

ABSORBS SOUND . . .
DEADENS VIBRATION



M & E Compressor Unit No. 1125 MC
1½ h.p. 2-cylinder, air-cooled condenser, self-cooled cylinder heads.

M & E bases are cast rather than pressed—for two principal reasons. First, because we have found that cast construction absorbs sound and vibration—does not amplify it—resulting in a quieter operating unit.

Second, because the rugged, inflexible casting provides a better foundation for the unit. This construction costs us more but we know the trade and users appreciate it.

It is another M & E Plus value. Write for new complete catalog, showing 45 compressor models from ¼ h.p. to 20 h.p. for every refrigeration and air conditioning need.

MERCHANT & EVANS
FOR THE *Plus Values*
IN REFRIGERATION



COMMERCIAL REFRIGERATION SERVICE

Construction & Operation of Thermostatic Expansion Valves Explained

CHAPTER 7—Evaporators & Refrigerant Controls (Cont.)

BY K. M. NEWCUM

Thermostatic Expansion Valves

Thermostatic expansion valves are used on almost all commercial installations, both single and duplexed. They are very flexible, accurate, and efficient, and should be very simple to install and service once they are properly understood.

So many servicemen differ in their ideas about how a thermo valve operates and what it is supposed to do, that it has become a much misunderstood control valve, and has been condemned in many cases where the valve was not at fault. In most of these cases the trouble has been traced directly to lack of knowledge of the fundamental purpose of the thermo valve, or in its application.

There is naturally a direct relation between the valve and the evaporator. In the discussion of evaporators it has been pointed out that the valve proper is attached to the inlet of the evaporator and the thermo bulb attached to the suction line near the outlet of the evaporator. The function and advantage of a drier coil or heat interchanger was pointed out. Throughout this discussion attention was drawn to the importance of adjusting the valve so as to frost the entire evaporator, or as otherwise expressed, operate at the lowest possible superheat.

At no place in this discussion was there any reference to the thermo valve controlling the temperature of the evaporator or in any way acting as a temperature control valve.

That is the part most generally misunderstood about the thermo valve. Before proceeding further, the fact must be established that the sole purpose of the thermo valve is "to control the amount of liquid refrigerant entering the evaporator."

This is accomplished by the action of the thermo bulb and the power element. A very interesting study of the thermo bulb and power element

may be made from Figs. 158, 159, and 160.

First, by means of a metal clamp, the thermo bulb is securely clamped to the suction line (see Fig. 161), near the end of the evaporator, and a definite thermal contact is made between these two parts.

Next, assume that the compressor has just completed its on-cycle and the temperature of the suction line and bulb is 33° F. This condition is illustrated in Fig. 158.

At this temperature some of the refrigerant, with which the power

Thermo Bulb Clamped On

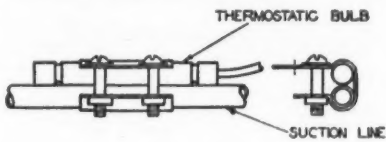


Fig. 161

element and bulb is charged, has condensed into a liquid. At this temperature there is a very definite corresponding pressure inside the power element bellows, tube, and thermo bulb. Following the vapor pressure chart for Freon-12 with which we will assume this bulb is charged, the pressure at 33° F. would be approximately 30 lbs. per sq. in. gauge.

During the off-cycle, heat leaks into the refrigerator increasing the temperature of the evaporator, suction line, and thermo bulb.

In Fig. 159 the temperature of the suction line and thermo bulb has increased to 45° F. Also some of the liquid refrigerant has vaporized. With this increase in temperature, there is a corresponding increase in pressure which for Freon-12 is to 41.7 lbs. per sq. in.

This increase in pressure of from 30 lbs. to 41.7 lbs. has caused the

flexible metal bellows (power element) to elongate or expand.

This illustrates the point that as the temperature of the bulb increases, it elongates the bellows and to reverse the cycle, as the temperature and corresponding pressure decreases, the bellows contracts or becomes shorter.

With this in mind, study carefully the automatic expansion valve shown in Fig. 162. The operation of the automatic valve is simple. As the compressor operates, the pressure in the low side of the system is decreased which responds on the bellows, allowing the adjusting spring to force the bellows inward, or in other words, elongate the bellows. This inward movement of the bellows responds on the actuating pins which force the needle downward against the pressure of the valve needle spring and as the needle leaves the seat, liquid refrigerant enters the evaporator.

This incoming liquid immediately expands with the resulting increase in pressure responding on the bellows, causing it to move outward again to close or throttle the valve. This operation is automatic and continuous throughout the running cycle. In other words, a very slight pressure difference causes the bellows to over-

Synopsis of Service Manual

On this page is a continuation of Chapter 7 of the **COMMERCIAL SERVICE MANUAL** by K. M. Newcum, author of the popular **MASTER SERVICE MANUAL**.

A summary of the previous instalments follows:

Chapters 1 and 2 were omitted from the News, as they are of basic material which has previously been covered in the paper, but they will appear in the completed book.

Chapter 3, Cylinders, Valves, and Safety Devices for Refrigerants—Aug. 5, 12, and 19.

Chapter 4, Methods of Transferring Refrigerants to Smaller Cylinders—Aug. 19.

Chapter 5, Drying of Refrigerants—Aug. 26.

Chapter 6, Commercial Condensing Units—Sept. 2, 9, 16, 23, 30; Oct. 21; Nov. 4, 11, 18, 25; Dec. 2, 9, and 16.

Chapter 7, Evaporators and Refrigerant Control Valves—Dec. 23, 30; Jan. 6, 13, 20, 27; Feb. 3, 10, 24; Mar. 3, 10, 17, 24, 31; and April 7.

come or overbalance one spring or the other as the case may be.

When the compressor shuts down, there is no more sucking action and, therefore, with the evaporator temperature constantly increasing, the refrigerant contained in the evaporator expands just the same as the refrigerant in the power elements and bulbs shown in Figs. 158 and 159.

This expansion or increase in pressure responds on the bellows to force it outwardly against the pressure of the adjusting spring and the valve needle spring holds the valve needle tight against the valve seat. The valve remains tightly closed during the entire off-cycle.

When the compressor starts, it gradually reduces the pressure which has built up in the evaporator and low side to the exact set operating

Automatic Expansion Valve

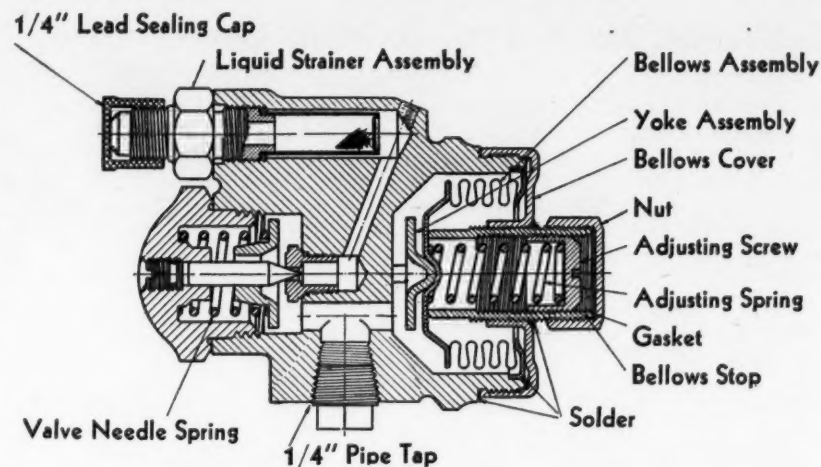


Fig. 162—Construction of automatic expansion valve.

Thermostatic Expansion Valve

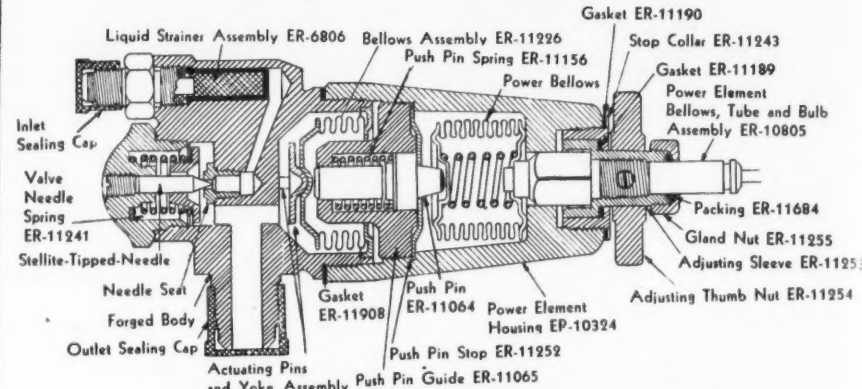


Fig. 163—Construction of thermostatic expansion valve.

pressure of the valve or, what amounts to the same thing, to the point where the reduced pressure and its action on the bellows allows the adjusting spring to overcome the valve needle spring and the valve opens to continue its automatic function during the on-cycle of the compressor.

The important point to bear in mind is that the valve remains closed during off-cycle and does not open until the pressure is reduced to the set operating pressure of the valve by the suction action of the compressor after the start of the on-cycle.

Examine closely the thermostatic valve in Fig. 163. Compare the body, valve needle spring, bellows assembly ER-11226, and other internal parts and they will be found to be just the same as found in the automatic valve, Fig. 162.

However, a power element, tube, and thermo bulb assembly have been added and the adjusting spring is replaced with push pin spring ER-11156, and a push pin (ER-11064) has been interposed between the power element bellows and the main body bellows. Note the spring inside the power element bellows.

Assume that as in Figs. 158 and 159 the thermo bulb is charged with Freon-12 and that the bulb and suction line temperature is 45° F., as represented in Fig. 159 with the compressor on the off-cycle. This would, according to the vapor pressure chart, prove that a pressure of 41.7 lbs. per sq. in. is being exerted on the power element which would have a tendency to elongate the bellows and open the valve needle.

But while the power element bellows is exerting a pressure of 41.7 lbs. per sq. in. against the push pin, bellows assembly, actuating pins, and

needle seat spring, attempting to open the valve—the refrigerant (Freon-12) pressure in the evaporator is exerting a like amount of pressure upwards against the body bellows attempting to keep the valve closed.

Close examination will reveal that the body bellows is slightly larger, that is, has a greater area in square inches than the power element bellows. With the same amount of pressure per square inch applying in both directions and the body bellows having the larger area, the body bellows over balances the power element and the valve needle spring holds the valve tightly closed.

Having established the fact that the valve remains closed during the off-cycle, assume now that the compressor has just started operating at a cut-in pressure of 41.7 lbs. per sq. in. low side pressure. (This represents the pressure at 45° F. evaporator temperature.) The condition of the thermo bulb would be as illustrated in Fig. 159 and the suction line temperature 45° F.

The sucking action of the compressor would immediately reduce the low side pressure and the pres-

(Concluded on Page 23, Column 1)

Operation of Thermo Bulb

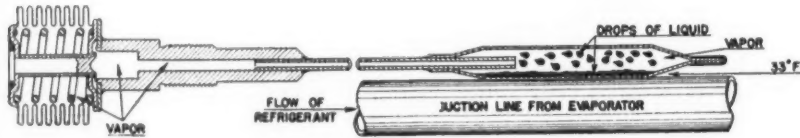


Fig. 158—At this stage, compressor has just completed on-cycle and temperature of suction line and bulb is 33° F. Some of refrigerant has condensed into liquid.

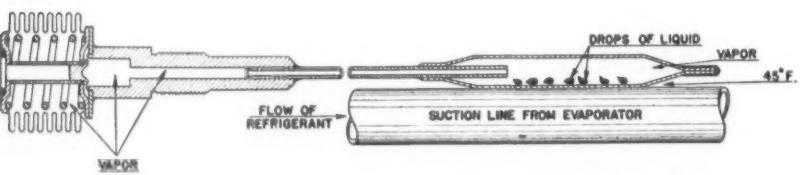


Fig. 159—At end of off-cycle, temperature of suction line and bulb has increased to 45°, and some of refrigerant has vaporized, bringing increase in pressure and causing metal bellows (power element) to expand.

Expansion Valve Power Element

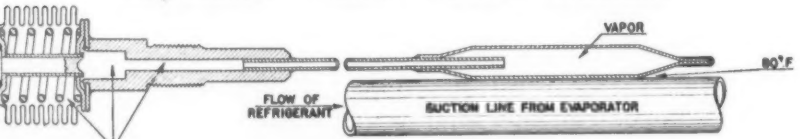


Fig. 160—Cross-section of expansion valve power element, showing power element bellows, tube, and bulb assembly.

TAG Snapon Controls FOR REPLACEMENT profits

TAG Snapon Controls with overload protection provide the essential element of dependability that you need in the profitable servicing of Domestic Refrigerators, Water Coolers and Beverage Coolers. Once adjusted, they permanently retain their temperature setting. Once set, the mechanism is locked against creeping. Send for your FREE copy of the TAG Catalog No. 1136-25 which describes these profit making Controls and other Test Equipment for Refrigerator Service.

CONSULT YOUR JOBBER ABOUT TAG CONTROLS AND TEST EQUIPMENT

C. J. TAGLIABUE MFG. CO. 550 PARK AVE. B'KLYN, N.Y.

This Simple patent is the secret that has made a SILENT V-BELT . . . and here's the reason



When a straight-sided V-belt bends around its pulley there is tension on the top of the belt and compression on the bottom. This makes the side walls bulge outward—as shown in figure 1, below.

The Gates Belt is built with a patented concave side. The bulge, due to bending, simply straightens the concave side to a precise fit with the sheave groove as shown in figure 2.

This exact fit naturally prevents slipping. No slipping means a SILENT belt, a belt that wears longer, a belt that does not heat and therefore does not stretch.

BELT GUIDE — FREE

The Gates Belt Guide is the recognized national authority on correct belt fit for ALL Refrigerators, Washing Machines, Pumps, Stokers, etc., etc. FREE from your Jobber or the GATES RUBBER CO., Denver, Colorado.

Write Today!

GATES BELTS



Figure 1

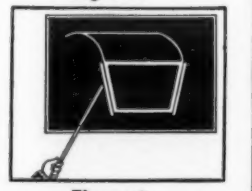


Figure 2.

CESCO HEALTHGUARD FUME KIT

IN any case of refrigerant leakage it is improvident to trust to the "mildness" of the fumes for respiratory safety. When a mask is needed, it IS needed! The place for it is right at the job—every time. HEALTHGUARD FUME KIT is light, compact, easy to carry along. Designed for this work, with interchangeable cartridges for methyl chloride, sulphur dioxide and ammonia. Mask is amazingly comfortable—on or off with one move. Write for literature.

CHICAGO EYE SHIELD CO. 2352 Warren Blvd. CHICAGO, ILLINOIS

Newcum Shows How Expansion Valve Effects Control

(Concluded from Page 22, Column 5) sure below the body bellows. With this reduced pressure below the bellows, the 41.7 lbs. per sq. in. in the power element will force the body bellows downward moving the needle away from the seat and opening the valve gradually. Liquid will then flow into the evaporator and immediately start boiling or expanding which, in turn, starts to reduce the evaporator temperature and low side pressure.

As the low side temperature and pressure gradually decreases, due to the heat being removed by the vaporizing of the liquid refrigerant, the valve opens wider, for the thermo bulb temperature at this point is still 45° F. and the power element is still exerting 41.7 lbs. per sq. in. pressure on the body bellows to keep the valve open.

This operation continues and the evaporator temperature and pressure gradually decrease until finally by conduction or by some of the liquid refrigerant finding its way to near the end of the evaporator the suction line and thermo bulb starts to get cold and with this decrease in bulb and power element pressure, which in its manner tends to allow the valve springs and body bellows to move the needle nearer the seat to throttle or reduce the inflow of liquid refrigerant.

Accompanying this reduced low side pressure is a corresponding reduction in refrigerant and evaporator temperature.

If the compressor is controlled by a low-pressure control, it is at the lowest point of this reduced pressure part of the cycle that the control cuts out to stop the compressor. This is, of course, depending on whether or not the cycle has been sufficiently long to properly reduce the refrigerant temperature. This same condition would apply to a system in which the compressor operation is thermostatically controlled.

During this reduced temperature and pressure part of the cycle, if the warmer air contacting the evaporator has been sufficiently reduced in temperature so that it does not cause an appreciable rise in evaporator and bulb temperature, the low-pressure control does cut out and stop the compressor or the thermostat will cut out as the case may be.

If, however, the refrigerator has not been reduced to its proper temperature, the warmer air affects or warms up the thermo bulb, for with the throttled valve, the saturated vapor or liquid has been drawn away from the bulb area of the evaporator, and the resulting increase in temperature and pressure of the bulb opens the valve wider to allow more liquid to enter, expand, and remove the heat units from the refrigerator until the cutting out point is finally reached.

Hellenthal Opens Five Branch Stores in Seattle Area

SEATTLE—Five new branch stores have been opened in Renton, Kirkland and other neighboring towns by the Hellenthal organization, General Electric dealer.



MACHINE MAKERS LIKE ARTIC because its favorable combination of properties permits building compact, light-weight units that operate efficiently and economically.

Service Men like ARTIC because its high purity, wide distribution and ease of handling contribute to convenient, dependable work in recharging Methyl units.



E. I. Du Pont de Nemours & Co., Inc.
THE R. & H. CHEMICALS DEPT.
Wilmington, Delaware

Refrigerant Issue Still In Conflict at Final N. Y. Code Hearing

(Concluded from Page 1, Column 1) represent no private interests at the meeting, presented an extensive report on tests he had conducted on the flammability of Freon when in contact with open and unhooded flames.

Mr. Brizzolara objected to "the whole classification of refrigerants as listed in the proposed Nov. 24, 1936, revisions," stating that he was convinced all 18 refrigerants presented some hazards as irritants or fire dangers under conditions of leakage or contact with open flames.

Mr. Brizzolara declared that in his opinion and experience, oil presence in refrigerants under pressure constitutes a serious hazard. Freon-oil mixtures as normally found in a system and released through a small leak will spray a long-hanging fog that will command anyone's attention, he claimed.

Mr. Brizzolara reported on some tests which he had made with oil and Freon-12 mixtures that varied from 15% to 35% by volume—a percentage of 10 to 23% by weight, said to be a normal condition or situation.

"In my tests I aimed beautiful fog oil vapors from my leak against walls and ceilings a distance away and saturated the surfaces well," said Mr. Brizzolara. What part of this fog was oil and what part water vapor was hard to distinguish.

"With 40 lbs. gauge pressure an oil saturation was readily observable on the floor for a distance of 8 feet when holding the leak horizontal 3 feet above the floor.

"When this fog was sprayed on a heated nichrome wire it burned briskly in a draft, and with occasional small flashes of vapor fire. Blown on a hot plate of about 650° F., a very smoky white vapor floated about for many minutes. When blown on a hot plate of about 700° F. over which there was a draft, the oil and refrigerant vaporized and burned when lit with a match.

"While it was possible by maneuvering to blow the fire out with an

Freon-12 vapor draft, as often as not that experiment was unsuccessful."

In reply to Mr. Brizzolara's statements, two technical experts employed by the Board of Hazardous Trades declared that "all refrigerating systems except absorption machines would have been stopped if his statements are true." These men said that slight explosions were possible at very high temperatures, but that under ordinary conditions most refrigerants were safe.

Commissioner Giaccone reported that the board had asked 11 reputable university chemists to criticize the classifications of the code's 18 refrigerants on the basis of their properties as irritants and for flammability, and that all reports had been "dubious and uncertain, particularly in regard to the newer refrigerants listed."

The board's technical advisers reported that in their opinion F-12 (dichloromonofluoromethane) should be reclassified as "irritant and non-flammable" instead of "non-irritant and non-flammable" as under present classification.

Continuing his testimony, Mr. Brizzolara declared that his tests showed Freon vapor at 40% humidities will turn blue litmus paper pink, thus indicating an irritant reaction, and that a hot surface—a stove lid—decomposes Freon and forms acids to the extent of the moisture contained in the air.

Mr. Brizzolara rapped the "odor clause" which, he claimed, had been in the city's code "for generations," declaring that many escaping refrigerant vapors do not give an odor warning and may prove deadly.

E. T. Williams, consulting engineer, testified that in his opinion all the following refrigerants become irritant when exposed to open flame: Freon, F-114 (dichlorotetrafluoroethane), Carrene No. 1 (methylene chloride), F-21 (dichloromonofluoromethane), F-11 (trichloromonofluoromethane or Carrene No. 2), and F-113 (trichlorotrifluoromethane or Carrene No. 3).

Mr. Williams also objected to the proposed code's provisions limiting the open flame clause to certain classifications of buildings. He asked that all points where refrigerants come into contact with open flame be included in the final draft of the code.

Commissioner Giaccone provoked

heated discussion by suggesting that "all refrigerants, in all public places and department stores and without discrimination or class, be confined to the roof of buildings."

"This board is trying to avoid a charge of creating a monopoly for Freon," Commissioner Giaccone declared. "Certain private interests have appeared to request private sessions with the board. These have been granted, and these parties have made allegations to us which they have later appeared before us to retract, even going to the trouble of writing us letters to that effect."

In reply to the commissioner's "roof" suggestion, Mr. Williams stated that it was "absolutely impractical to try to confine refrigerating systems to roof locations," and that "it would be better for all concerned to devote more attention to perfection of refrigerating systems than the gases in them."

F. A. Eustis, of Virginia Smelting Co., stated that sulphur dioxide was used in more small refrigerating systems in the New York area than any other refrigerant.

Pressing his suggestion regarding locating all refrigerating machines on roofs, Commissioner Giaccone called for more discussion on this proposal.

H. N. Street, representing the New York Retail Dry Goods Association, said:

"We can't sell refrigerators on a roof when we tell customers that they are absolutely safe to use in their homes. The fire department will say they are hazardous, and department stores will say they are not, and will try to sell them."

"You are worried about sales, and we are concerned with public safety," Commissioner Giaccone replied.

H. D. Edwards presented a lengthy list of rewordings for the proposed revisions dated March 23, 1937, and asked the board for more exact definition in the code of hermetically sealed units.

W. Walker, representing Ansul Chemical Co., offered reports of additional tests on Freon for the board's consideration, allegedly showing that this refrigerant has irritant properties when exposed to open flames.

Commissioner Giaccone told Mr. Walker that the board admitted that Freon had certain irritant properties when decomposed by fire, and that further discussion on this phase of

the code was useless and a waste of time. When Mr. Walker pressed his demands for the board's consideration of his tests, he and the commissioner engaged in a verbal tilt which ended with Mr. Walker's retracting several of his statements.

The commissioner stated that it was the recommendation of the board's experts that Freon is safer under ordinary conditions than most other common refrigerants, but that under unusual circumstances it was more unsafe than others.

Commenting on past public hearings regarding the code, Commissioner Giaccone declared that "too many salesmen and too few technical experts have appeared before this board. Many witnesses have admitted in the end that their stated opinions were directed towards matters of sale and not unbiased discussion to reach a sensible solution for public safety."

He also said that it would be a great aid to the Board of Hazardous Trades if New York City would create a Board of Technical Advisers to assist in formulation of codes of this kind.

Approximately 150 men attended the hearing.

Besides these, the following members of the Board of Hazardous Trades were in attendance:

Francis X. Giaccone, deputy fire commissioner, chairman; Patrick Walsh, assistant fire chief; George L. McKenna, assistant fire chief; Michael Conway, deputy chief in charge of the Division of Combustibles, John F. Dixon, acting chief inspector, Division of Combustibles, boroughs of Manhattan, Bronx, and Richmond; James A. McCabe, acting chief inspector, Division of Combustibles, boroughs of Brooklyn and Queens.



Poor Old Joe...

THEY SAID THE CLOGGED VALVE WAS HIS FAULT!

Joe is a good service man, and it wasn't fair to say the clogged valve on that CU-327 unit was due to his carelessness.

The fact is, moisture sufficient to clog a valve is likely to be in any unit, no matter how carefully it has been handled. Intricate passages trap the moist air, and hold it even despite baking.

That's why Activated Alumina is so useful. Activated Alumina absorbs moisture, drinks up the last trace of vapor. When valves clog, a convenient cartridge of Activated Alumina, temporarily inserted in the system so the refrigerant can circulate through it, removes moisture quickly, inexpensively, and permanently. These cartridges are available from several makers, and some refrigerator manufacturers prevent trouble from the start, by installing permanent cartridges of Activated Alumina in their units. ALUMINUM ORE COMPANY. Sales Agent: ALUMINUM COMPANY OF AMERICA, Pittsburgh, Penna.

**ACTIVATED
ALORCO
ALUMINA**

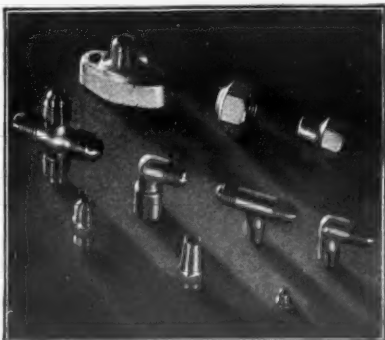
PREVENTS CLOGGED REFRIGERATOR VALVES

PERFECTION

-5 MAJOR LINES--all CERTIFIED TO EXCEL-



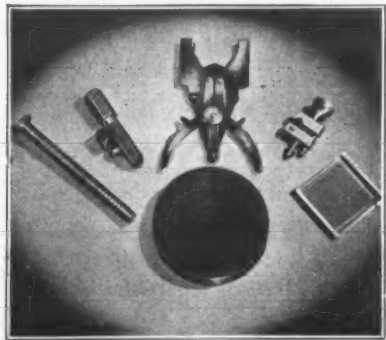
COMPRESSOR PARTS



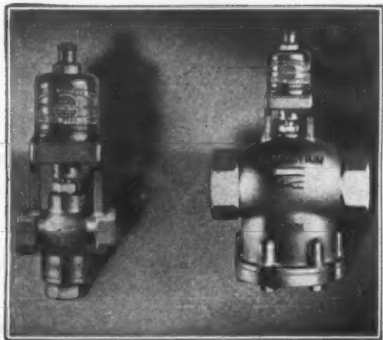
FITTINGS



VALVES



SERVICE TOOLS



WATER REGULATORS

Since its inception PERFECTION has maintained a rigid policy of manufacturing dependable parts that are certified to excel.

So well has Perfection achieved the ideal of excellence that throughout the country progressive men engaged in rendering refrigeration service associate satisfied customers and a growing business with the name, Perfection. Backed with more than fifteen years' experience in the manufacture and sale of automotive replacement parts, in 1935 PERFECTION brought to the refrigeration parts field the great resources, talent and facilities of an established, successful organization.

Today, the symbol of Perfection is universally recognized in the refrigeration field, as well as in the automotive industry, as assurance of skilled engineering, the use of the best suited materials, precision workmanship and efficient service.

This universally popular line includes VALVES, WATER REGULATORS, FITTINGS, TOOLS, and COMPRESSOR PARTS. The compressor parts are not limited to a single make, but are available for Copeland, Frigidaire, Kelvinator, Servel, Universal Cooler, Zerozone and others.

Leading jobbers everywhere handle Perfection products—and it pays to look for the Perfection emblem when purchasing refrigeration parts.

PERFECTION REFRIGERATION PARTS CO.
(A division of Perfection Gear Company . . . Established 1919) HARVEY, ILLINOIS

For the Air-Conditioning Distributor-Contractor

This is No. 11 in the series, "How to Select and Install Air-Conditioning Systems" by T. H. Mabley, chief engineer for a Detroit air-conditioning distributor.

Previous articles in this series have been published as follows:

Case No. 1, A Single Office (Jan. 6); No. 2, A Conference Room (Jan. 13);

No. 3, Residence System with Room Cabinets (Jan. 20); No. 4, Typical Commercial Application—A Shoe Store (Feb. 3); No. 5, A Beauty Parlor (Feb. 24); No. 6, A Coffee Shop (March 3); No. 7, A Process Job (March 10); No. 8, A Doctor's Suite (March 17); No. 9, Central System for a Group of Offices (March 31); and No. 10, A Residence (April 7).

HOW TO SELECT AND INSTALL AIR-CONDITIONING SYSTEMS

By T. H. Mabley, Chief Engineer
Mechanical Heat & Cold, Inc., Detroit

Case No. 11 Upper Floor of A Residence

In the previous instalment (Case No. 10) we discussed the layout of a system to provide air conditioning for the major rooms on the first floor and one second floor bedroom in a typical residence.

In this case we will deal with the same house, but now the owner wants to air condition, for the summer months only, all the second floor bedrooms.

The building construction does not permit installation of risers to all the bedrooms from the basement unit. We had shown in the previous problem how it was possible to run a riser up to the second floor through the broom closet to bedroom No. 3, but no such convenient arrangement is possible for the other rooms.

For this reason we will consider the air conditioning of the second floor rooms as a separate problem and will eliminate the riser to bedroom No. 3, shown in Case No. 10. Main purpose in making this new installation is to provide a comfortable temperature condition in the summer months. Of course, other functions will be considered, particularly since we are dealing with the conditioning of bedrooms.

It is the natural and healthful practice to open bedroom windows upon retiring and this of course complicates the air-conditioning problem. While no complete and definite data is available on the subject, it is generally believed that air circulation for comfort in sleeping is as important at least as a large quantity of fresh air.

It is mostly for the purpose of getting a good circulation of air

that bedroom windows are opened at night. In view of this idea the air-conditioning problem becomes simpler. If we can provide a comfortable circulation of air along with some ventilation, the most desirable sleeping conditions can be maintained without overburdening the system with the windows opened wide.

Design conditions in this case are the same as those discussed for the conditioning of the first floor, but some allowance may be made for the fact that the average outside temperatures will not be quite as high during the period of occupancy of the bedrooms. For this and other obvious reasons the inside design temperature will be somewhat lower.

If because of sickness in the family or some other reason, one of the bedrooms should be occupied during the daytime, the full load of the system could be directed to this room by closing off the air supply to the other areas.

In determining the cooling load on the system, the heat gain is calculated for each room in the usual manner. The total of the three rooms amounts to 27,200 B.t.u.

If we refer to a manufacturer's rating sheet we select an air-conditioning unit with an approximate capacity of 30,000 B.t.u. at 42° refrigerant temperature, a ratio of .70 sensible heat to total heat, and with mixed air entering at 80° dry bulb and 47½% relative humidity.

The unit has a total air capacity of 800 c.f.m. This air quantity will be distributed proportionately with the three areas to be conditioned as follows:

	B.t.u.	c.f.m.
Bedroom No. 1	9,200	270
Bedroom No. 2	7,900	233
Bedroom No. 3	10,100	297

In making a study of the physical conditions of the house, we have con-

cluded that the best arrangement will be to install a conditioning unit in the attic space and connect each room to it by a duct system.

Since the attic space is unfinished and used only for storage space, the ductwork can be run across the attic floor and the unit placed directly on the floor.

The particular location shown in Fig. 1 was selected because it was not directly above a bedroom. The unit must be carefully mounted on vibration-absorbing material and selected on a basis of minimum noise of operation.

In spite of all these precautions in some space not directly over sleeping quarters.

The air conditioner selected for this application is a standard unit complete with belt-driven blower, direct-expansion cooling coils, and filters. The cooling coil may be connected to the compressor located in the basement (used also for the first-floor conditioning unit).

The refrigerant and electrical lines may be carried up to the attic unit from the basement through the broom closet on the first floor, and thence through the clothes closet on the second floor.

For the purposes of economy it is not intended to operate both the first and the second-floor systems simultaneously for cooling so that a compressor can be selected to handle the full load of either of the two conditioners separately.

A solenoid refrigerant valve will be installed on the liquid line of each conditioner to control the cooling operation of each system.

To provide automatic control for the two systems, a cooling thermostat will be located on each floor. Each will operate a separate double-pole relay. One pole of each relay will control, through a magnetic starter, the operation of the refrigeration machine; the other pole will open and close the solenoid valve located at one of the conditioning units.

The change-over control operation from one unit to the other may be accomplished by several methods.

A single manual switch placed at some central point such as the first floor hall may be used, or it may be advisable to install a standard 3-way switch on each floor and connect them to operate an auxiliary relay to turn off one system and turn on the other. This same operation may be performed automatically by a time clock, either the commercial or wall-mounted thermostat type.

It would be possible even to provide an auxiliary relay connected through a summer-winter manual switch to certain types of clock thermostats already in use for automatic control of the heating system.

Next step is to lay out the air-distribution system. In each room there will be a discharge outlet located in the wall and near the ceiling. This opening will be equipped with a hand-operated damper and a diffusing-type grille.

The outlets will assure proper air distribution without encountering the danger of throwing a stream of air directly toward the possible location for the head of a bed.

Openings for the register boxes will be cut in the plaster partition and up through the partition plate into the attic space. To avoid the necessity of a register of undesirable depth, it will be advisable in the case of bedrooms Nos. 1 and 3 to utilize two stud spaces, preferably by "heading off" a double stud space below the opening.

Instead of installing return-air openings in each room, a common return will be provided in the hall ceiling at a location least conspicuous.

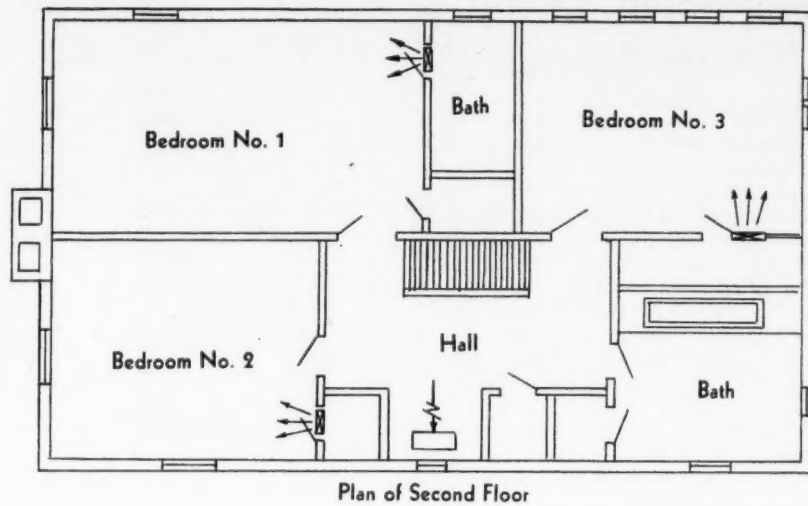
Louvers will be installed in the lower panels of each bedroom door to permit free passage of air when the door is shut. A fresh air louver will be installed in the side of the building under the eaves, and connected by a short duct to the conditioner. The proportion of fresh and recirculated air will be controlled by a single splitter damper at the point where fresh and return-air ducts join the intake plenum.

The position of this damper may be controlled manually from the floor below by a chain regulator. All ductwork and the unit itself must be heavily insulated to prevent excessive conduction loss due to high temperatures characteristic of the space during summer months.

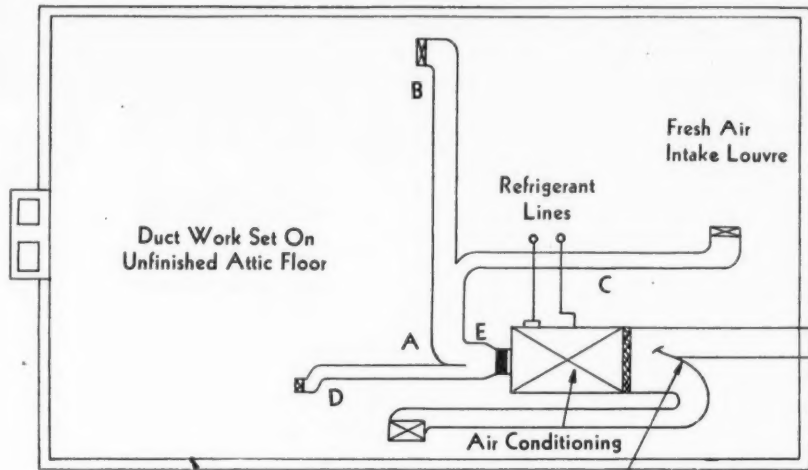
In sizing the ductwork for this system, there is another method

(Concluded on Page 25, Column 1)

Layout for Bedroom Installation

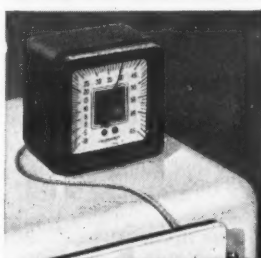


Plan of Second Floor



Plan of Attic Floor

Splitter Damper For Air Mixture Control



The handiest too in the kit—

For all service jobs—checking switch action, answering complaints of too high or too low temperatures—checking brine tanks and vessels, servicing household refrigerators, commercial boxes, cold storage jobs. Also valuable in selling refrigerators, making surveys of cooling jobs, etc.

WRITE FOR NEW REFRIGERATION CATALOG

Announcing the MARSH "Serviceman"

REFRIGERATION SERVICE THERMOMETER—why GUESS when you can KNOW

More and more it is becoming apparent to service men and distributors that the only correct and convincing reading of refrigerator temperature is made under actual working conditions with the refrigerator closed. The new Marsh "Serviceman" has been built to supply this need for a compact, versatile service thermometer, sturdy and accurate, yet modestly priced with plenty of capillary tubing for reaching any desired point of testing. Its clear dial with big divisions is easily read. There is no guess work as when an ordinary pocket thermometer is used. You know—and so does the customer!

"Recalibrator" assures lasting accuracy

The "Serviceman" is guaranteed accurate within one degree. If it is knocked out of adjustment, you simply place the bulb in cracked ice and water, and turn the "Recalibrator" screw until the pointer reads 32°. It will then be right at every point on the dial. This is not the conventional pointer resetting device which is always subject to error. It is a real re-calibration—an exclusive feature of Marsh Instruments. Modern facilities and volume production make it possible to sell this finely built, precision instrument (in ranges of -10° to +65°F. or -10° to +100°F.) at a dealers net price of \$5.00 (Minus 20° temperature range at slightly higher price.)

JAS. P. MARSH CORPORATION

2100 SOUTHPORT AVENUE, CHICAGO

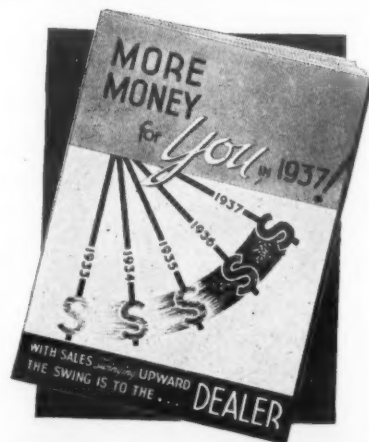
This is the FIRST BIG PROFIT YEAR for Electric Ranges!

The PIONEER DAYS of electric range merchandising have ended. The PROFIT DAYS are here.

This new booklet illustrated with charts and diagrams tells the story of the outstanding profit opportunity presented by the selling of electric ranges—right now.

We'll gladly send you this book without cost or obligation. Use the coupon for convenience.

ELECTROMASTER, INC.
1805 East Atwater Street
Detroit, Michigan



COUPON

ELECTROMASTER, INCORPORATED
1805 E. Atwater St., Detroit, Mich.
Please send me without obligation your new booklet: "More Money for You in 1937!"

Name _____

Firm Name _____

Kind of Business _____

Address _____

City _____ State _____

Figuring Equipment for Conditioning Second Floor of Residence

(Concluded from Page 24, Column 5) sometimes used for selecting duct dimensions. The total Pressure Method and Velocity Method previously have been described.

In this case consider the Unit Pressure Method. The procedure is simple. Having first determined the quantity of air to each room, the volume of air in each section of duct can be found.

Next step is to select one value of static pressure drop per 100 feet which can be used for every section. In this case we arrive at that of .06.

With this constant we can refer to the air-flow chart and select the equivalent round pipe diameter for each section. It is advisable to take note of the air velocity when using the chart to make certain that the velocities do not run too high and cause noise trouble.

We can check the maximum air speed in the section handling the largest amount of air—in this case 665 f.p.m. This air speed is not objectionable. If it had proved to be too high, we would have been obliged to use a lower figure of static pressure per 100 feet for our basis of calculation.

Since the basis of this method is that the unit pressure drop be the same in all sections, this method is not practical for very elaborate or unbalanced systems. The total friction loss in the shorter branches would be much lower than in the longer branches. For this reason dampers should be installed in all branches.

Birmingham Utility Lists 70 Local Installations

BIRMINGHAM, Ala.—Seventy local air-conditioning installations and 11 dealers in air-conditioning equipment are listed in a booklet just published by Birmingham Electric Co.

Two of the dealers listed have been appointed recently. They are Pate Co., General Electric outlet, and Bethune Electric Co., handling Westinghouse equipment. The utility does not merchandise air-conditioning units.

The utility's booklet includes several testimonials regarding increased trade resulting from installation of air-conditioning equipment, and stresses the value of such equipment in smoky or foggy areas.

THE AIR AGE

Dehumidification by Lithium Chloride

BY F. O. JORDAN

Absorption of moisture from air by means of lithium chloride has come into use as a means of accomplishing the air-drying function of summer air conditioning.

An advantage of this method is that it allows the cooling function and the dehumidifying function to be dissociated and so controlled independently.

This in turn makes it unnecessary to penalize the refrigerating compressor by the low refrigerating temperatures necessary to balance the high latent to sensible ratio of some heavily populated night club, as the refrigerant temperature in the air-cooling apparatus may be held at the level best suited to high-efficiency air-cooling operation under thermostatic control only as necessary to maintain the most comfortable dry bulb temperature.

Any latent work not done by the cooling coil in conjunction with its prime function of cooling the air may then be taken care of by the lithium chloride absorber operating under humidistatic control.

The dehumidifying rate may be governed as required, either by regulating the proportion of the total air circulated, which is passed through the absorber, and/or by regulating the moisture-absorbing capacity of the absorber through control of the concentration of lithium chloride.

The moisture-absorbing rate of the lithium chloride depends upon its concentration, because the rate of moisture absorption at a given dew point increases as the partial vapor pressure of the solution of lithium chloride and water is lowered while the partial vapor pressure at a given temperature is reduced as the concentration of lithium chloride is increased.

Moisture-absorbing rate may be influenced also by regulating the temperature of the solution, as the partial vapor pressure is reduced as the temperature is lowered.

Factors which make lithium chloride acceptable for this type of operation are low cost, freedom from odor, chemical stability, and the fact that it is neither toxic nor corrosive. Furthermore, the viscosity of the solution is low, and the partial pres-

sure of the lithium chloride itself is amply low to prevent it from being carried away by the air stream.

The "open" absorption system, as this system is called because part of it is open to atmosphere, consists of the following principal elements:

(a) **Conditioner**, or absorber, in which the strong lithium chloride solution is supplied at the top to trickle down over a "filler" of fiber, or cords, to absorb the moisture from the air which is passed upward in contact with the absorbing surfaces.

(b) **Boiler**, or generator, to which the weak solution from the conditioner is circulated, where the moisture is boiled off to atmosphere, and from which the strong solution is returned to the conditioner.

(c) **Heat exchanger**, where the overall efficiency of the entire system is improved considerably by transferring a portion of the heat in the strong solution which is fresh from the boiler, to the weak solution which is on its way to the boiler.

With some installations, the closed boiler is omitted in favor of a generator in which the moisture is evaporated from the weak solution and carried away by a warm air stream.

The overall efficiencies of the lithium chloride open absorption system are said to be in the neighborhood of 60%, while relative humidities of 15% to 20% of the air from the conditioner are obtainable.

With this type of system, well water, the temperature of which is not low enough to accomplish the required dehumidification, sometimes is used for sensible cooling.

What Price Air Conditioning?

Why do such mistaken ideas persist regarding the cost of residential air conditioning?

Purporting to classify the prospects for present-day air conditioning for its readers, a recent issue of a trade journal disposes of the residential air-conditioning field of the present by saying merely that it consists of "wealthy people who can afford \$2,000 to \$12,000 installations."

So the minimum price for air conditioning the home is \$2,000? So one would be led to believe by this statement.

However, we understand that complete self-contained cooling units for the living room are available at an installed price of less than \$500, while several manufacturers offer cooling equipment which can be added to any conventional central system warm-air heating or winter "air-conditioning" plant for the average home at a cost of less than \$1,000. The latter type of installation can be arranged to do a good job of cooling the living quarters of the usual residence in the daytime and the sleeping quarters at night.

Some of the fault rests with certain dealers, some of whom actually seem to lag behind the public in summer "air-conditioning-mindedness." Cases are on record where the ardor of enthused prospects has been effectively dampened upon their inquiring about summer air conditioning, by the astounding answer from the air-conditioning salesman to the effect that summer air conditioning is "too expensive yet," and the admonition that the prospect had best

content himself with installing a "So-and-So" winter air-conditioning system for the present, and then add summer conditioning two or three years later "if you feel like it."

Has Residence Conditioning Arrived?

Year-around air conditioning for the house of moderate cost is an accomplished fact today, says "Good Housekeeping" magazine in an article in the March issue entitled "Air Conditioning As You'd Like It."

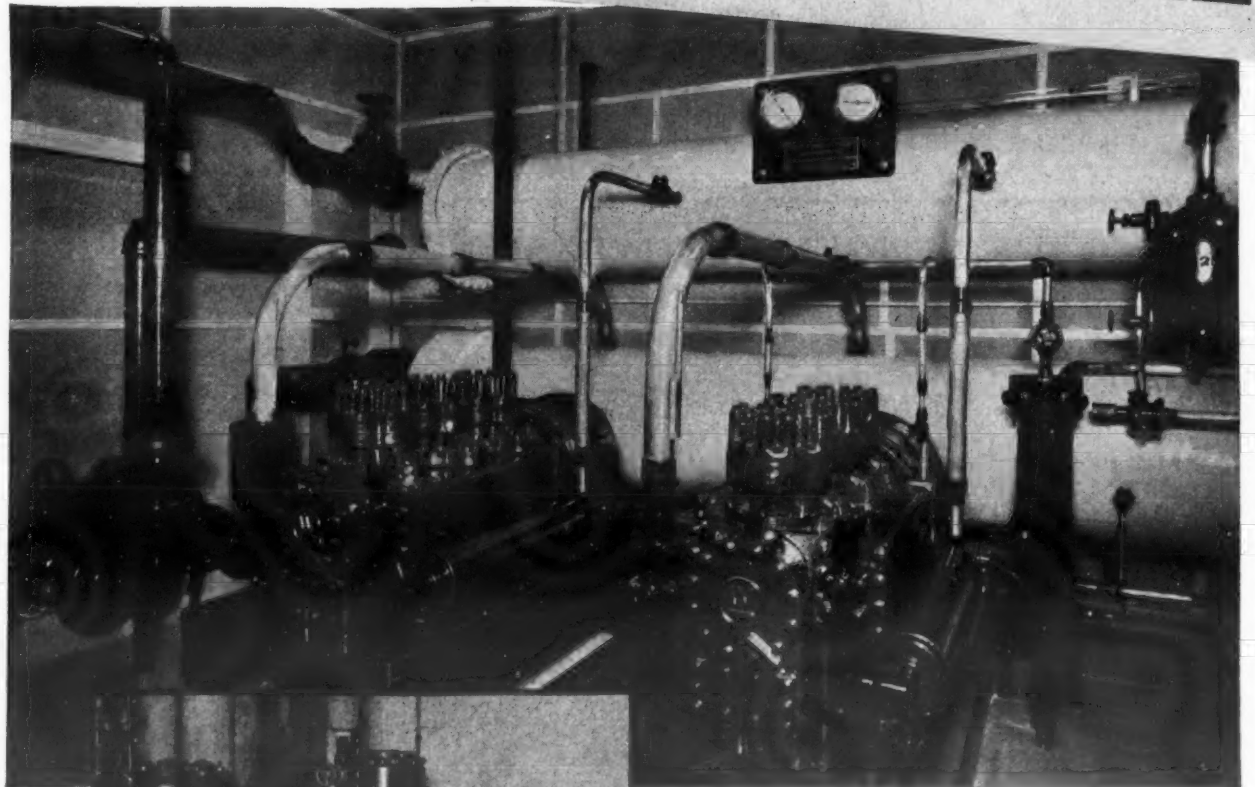
For years Good Housekeeping Institute has prophesied that "some day complete year-around air conditioning would be within reach of all of us" and that the development of such a system "was just a matter of time."

It was not long, states the article, before the Institute was reporting on room units and finally on efficient, practical, complete house systems, but the one thing that has always stood in the way of the average homeowner has been the cost.

The article goes on to tell that today in suburban Detroit there is a group of thirteen houses "which cost between \$7,000 and \$7,500 to build exclusive of land, but including a building contractor's profit and a real-estate broker's commission, and every one of these houses is equipped for year-around air conditioning, heating and humidifying in winter, cooling and dehumidifying in summer, continuous air circulation and filtering at all times."

The homes referred to are the Kelvin Homes which were built by the Nash-Kelvinator Corp. as a result of experiments performed in its Research Home.

HOW DRY THEY ARE



These six Capella Oils all have sub-zero pour points. They are suitable for use with any type of refrigerant. In viscosity, they range from 70 to 500 Saybolt at 100°F. They are the most complete series of refrigerating oils available today. Send for free booklet.

meet your requirements. All six Capella Oils are the highest attainable quality . . . all will give you freedom from reaction to the refrigerant, freedom from break-down into tarry, gummy, sludgy deposits.

Your nearest Texaco warehouse will gladly provide practical engineering service on this or any other Texaco Product.

THE TEXAS COMPANY

135 East 42nd Street, New York City

2020 warehouses assure nation-wide prompt delivery



TEXACO

Industrial Lubricants

CONDENSERS EVAPORATORS

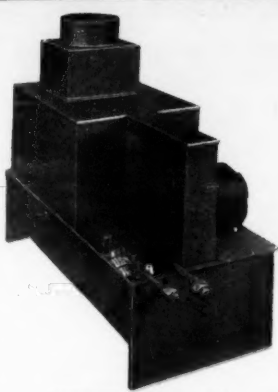
33 years specialized experience in this field has qualified us to give you intelligent, practical engineering cooperation on both electric refrigeration and air conditioning applications, large and small.

LONG MANUFACTURING DIVISION
BORG-WARNER CORPORATION
DETROIT, MICH.
WINDSOR, CAN.

LONG

— BUYER'S GUIDE —

SUPPLIERS WHO SPECIALIZE IN SERVICE TO THE INDUSTRY



MODEL PWS 1½
Available for compressor capacities of from 1½ to 25 tons.

THE PEERLESS WATER SAVER (EVAPORATIVE CONDENSER)

Saves from 85% to 95% on Water Costs for Refrigerant Condensing

The man who signs the checks knows, —water costs for condensing in air conditioning and large refrigeration installations are a formidable item of expense. But the Peerless Water Saver will reduce this cost as much as 95%.

This new type of evaporative condenser is low in price but long on savings; of simple construction yet highly efficient in operation. It saves water; it saves electrical current by reducing the compressor load; it prolongs the life of the whole system.

Write for descriptive literature.

PEERLESS of AMERICA, Inc.

ESTABLISHED IN 1912 AS THE PEERLESS ICE MACHINE CO.

New York Factory
43-20 34th Street
Long Island City

Main Factory—General Offices
515 West 35th Street
Chicago

Pacific Coast Factory
3000 S. Main Street
Los Angeles

BUY PEERLESS FOR PERFORMANCE

NEW KOCH ECON-O-CASE

WELDED ALL-STEEL CONSTRUCTION
CORKBOARD INSULATION
TRIPLE GLAZING

HUMIDITY AND TEMPERATURE IN PERFECT BALANCE

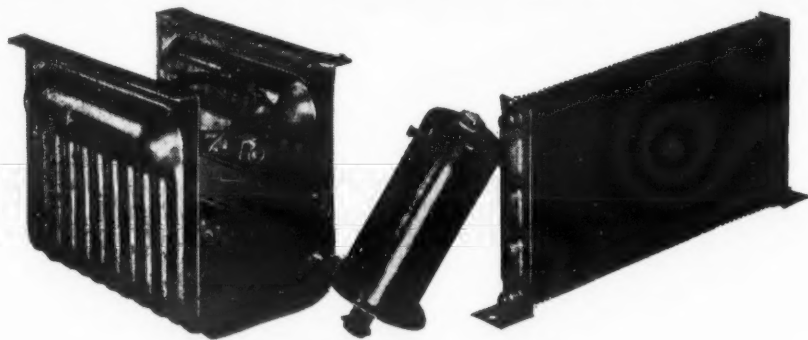
THE PRICE LEADER OF A BIG LINE

DISTRIBUTORS WILL BE INTERESTED

WRITE TODAY **KOCH REFRIGERATORS** EXPORT DEPT. 304 E. 45TH ST. N. Y. CITY

NORTH KANSAS CITY, MO.

SUPPLYING THE REFRIGERATION INDUSTRY



Evaporators, Receivers, Condensers, Compressor Domes, Compressors and Mechanical Parts. Also "Houdize," a perfected process for permanently uniting ferrous or non-ferrous metals.

OAKES PRODUCTS CORP.
North Chicago and Decatur, Ill.

HOUE ENGINEERING CORP.
Buffalo, New York

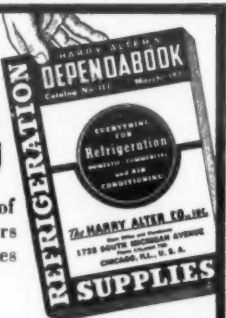
DIVISIONS OF HOUDAILLE - HERSHEY CORPORATION
General Executive Offices: Detroit, Mich.

Get this NEW BARGAIN CATALOG

Distributors and Jobbers of America's finest manufacturers in refrigeration parts, supplies and equipment.

THE HARRY ALTER COMPANY
1728 South Michigan Avenue
CHICAGO
BRANCHES
New York — Cleveland — St. Louis

From Crispers to Highsides, from Accessories to air conditioning equipment, from Artificial Food for displaying refrigerators to Refrigerated Display Cases for displaying food. Everything in refrigeration accessories, equipment, tools and supplies. The most complete line in the world.



Holcomb & Hoke Issues Sales Pieces for 'Fire Tender'

INDIANAPOLIS—Holcomb & Hoke Mfg. Co. has issued two promotion pieces and a window sticker for use by dealers for the company's line of "Fire Tender" automatic coal burners.

One of the promotion pieces deals entirely with the domestic Fire Tender, pointing out the various features of the unit and the benefits to be derived from its use. Installation of a Fire Tender, copy says, will "do away with your old 'cellar' and permit you to add another room to your home." A cost blank is provided for use in estimating saving which the equipment would make possible in any home.

The other folder describes the industrial fire tenders. In addition to listing features and advantages, the folder contains reproductions of two testimonials from users.

Bethune Electric to Retail Westinghouse Conditioning

BIRMINGHAM, Ala.—Bethune Electric Co. has been appointed a Westinghouse air-conditioning dealer here.

Air Conditioning MADE EASY

Presented below is a continuation of Section 14, Controls and Zoning of AIR CONDITIONING MADE EASY, by F. O. Jordan, air-conditioning editor of the News, and former assistant chief engineer of Airtemp, Inc.

The following instalments of the manual have appeared in the News: What Is Air Conditioning?—Sept. 23. Section 1, Introduction, and Section 2, Definitions and Simple Thermodynamics—Sept. 30.

Section 3, Coil Performance—Oct. 7 and 14.

Section 3A, Water Cooler Performance—Oct. 14.

Section 4, Condensing Unit Performance—Oct. 21.

Section 5, Air Movement and Ventilation Requirements—Oct. 28.

Section 6, The Complete Air-Conditioning System for the Cooling Season—Nov. 4, 11, 18, and 25.

Section 7, Heating—Dec. 2, 9, 16, 23, 30, Jan. 6, 13, 20, 27, Feb. 3, 10, 17, 24, March 3, and 10.

Section 10, Don'ts—March 17 and 24. Section 14, Controls and Zoning—March 31 and April 7.

— AIR CONDITIONING MADE EASY —

Inherent Control—Its Advantages and Disadvantages for Various Systems

SECTION NO. 14

CONTROLS & ZONING

BY F. O. JORDAN

Inherent control offers advantages in its certainty of operation, in its simplicity; in the lower first cost which it makes possible for the air-conditioning unit; in its freedom from patent entanglements; and in the ease with which it may be made to operate as desired within the comfort zone, especially if operation is under the control of an instrument in which the temperature setting is under humidistat control as described above.

The disadvantage of inherent control lies in the penalty which it places upon the condensing unit capacities and efficiencies, for (as described in Section No. 4) the condensing unit capacities and efficiencies are reduced as suction pressures are lowered. For this reason, the use of the inherent control principle requires slightly higher compressor speeds and increased power consumptions. In rare instances, larger motors may be required.

The figures given below are submitted in order to give a comparison between the costs of various methods of control. The figures are actual cost of equipment as made by a well known manufacturer.

Three representative types of projects have been selected as follows: Case No. 1—Restaurant with heavy occupancy, using a high percentage of outside air.

Case No. 2—Restaurant with light occupancy, using a low percentage of outside air.

Case No. 3—General office with 100% recirculation of inside air.

(See tables on opposite page.)

It will be noted that in all three cases inherent humidity control is lower in first cost, and slightly higher in operating cost. Inherent control is lower in first cost because the lower refrigerant temperature makes possible a reduction in coil size, while it is possible to use the same size condensing unit by increasing the compressor speeds.

In no case was it necessary to raise the compressor speed to the point of overloading the motor, nor beyond good practice as recommended by the manufacturer. However, there might be some cases when the use of inherent control would make necessary the use of a larger motor, in order to avoid overloading.

Split Inherent Control

At times, projects may be encountered in which the latent-to-total load ratio is higher than can be balanced by a practicable air-conditioning coil with entering air at the conditions obtained by mixing room air and outside air in the proportions demanded.

Upon such projects, neither "inherent" control nor "by-pass" control will suffice, so that either back-heating or "split-inherent" control must be used.

In comfort air conditioning the extremely high latent-to-total load ratio can be the result only of a very heavy occupancy concentration which de-

mands a very high proportion of outside air, in a locality where the outside air dew point temperature is very high.

As noted in Section 3, the latent-to-total capacity ratio of the coil is increased as the dew point temperature of entering air rises. By taking advantage of this fact, a very high latent-to-total capacity ratio may be obtained by circulating only outside air at a high dew point temperature through a coil in which a low refrigerant temperature is maintained.

Therefore, if a large proportion of the total air to be circulated is outside air at a high dew point temperature, a very high overall latent-to-total capacity ratio may be obtained for the entire unit by circulating all of the required outside air through a deep cold coil; and by circulating the recirculated air only through a coil whose principal function is to do sensible work. This is the principle upon which "split inherent" control is based.

With this type of control, the system is divided into two separate units, one unit being known as the "outside air unit" and the other unit being known as the "recirculated air unit".

All of the outside air is drawn through the outside air unit, while the coil for the unit generally is about 12 inches deep in direction of air-flow, and is operated at the lowest practicable refrigerant or water temperature and air velocity so as to obtain the highest possible latent-to-total capacity ratio. This coil must be of such a size that its latent capacity is equal to the maximum latent load at the outside air condition prevailing during the period of maximum latent load.

The coil for the recirculated air unit is a shallower coil, and is operated at a higher refrigerant or water temperature and air velocity. Through this coil, a sufficient quantity of air is recirculated at room condition as necessary to carry the portion of the maximum sensible load that is not carried by the outside air unit. Because of these operating characteristics the recirculated air coil does a high percentage of sensible work, but performs little latent work.

As the result of the types of coils selected, and because of the operating characteristics selected for the coils, the outside air unit performs the latent work which is necessary for the project, together with most of the sensible work which is attendant upon the latent loads, while the recirculated air coil does but little latent work and generally balances the sensible transmission loads.

The outside air unit is operated under the control of a thermostat and a humidistat connected in parallel so that either rising temperature or humidity will start the unit.

The recirculated air unit is operated under the control of a thermostat set a few degrees lower than the thermostat for the outside air unit.

Operation of the system is as follows:

During periods of very light occupancy, there is need for very little latent work or for very little outside air. During such periods, a rise in temperature will be due principally to transmission or sun loads.

Such a rise in temperature would operate the recirculated air unit only, which would introduce no outside air, and would do but little latent work. Any continued rise in temperature would operate the outside air unit, which would do a large percentage of latent work and would introduce outside air.

Since a rise in room humidity, or any considerable rise in room temperature (with the recirculated air unit in operation) could be the result only of the presence of occupancy, the running time of the outside air unit generally would be proportioned to the occupancy present, so that both the latent work and the quantity of outside air introduced would proportion themselves automatically to the need for them.

With this arrangement it is impossible for the conditioned space to be over-cooled by operation of the outside air unit when it is operating due to action of the humidistat, because the sensible capacity of the outside air coil is less than the sensible load attendant upon and in existence during the presence of the occupants who are the source of the latent load.

This is true because of the very high latent-to-total capacity ratio of the outside air coil resulting from the fact it works only upon outside air at high dew point. Over-cooling at other times will be impossible because the equipment is completely under thermostatic control during periods of light latent load.

Night Conditions

Dry Bulb Temperature.....	85°
Dew Point Temperature.....	72°
Latent Load	880,000 B.t.u.
Sensible Load	640,000 B.t.u.
Total Load	1,520,000 B.t.u.
Latent-to-total Ratio.....	57.8%
Air for Ventilation.....	15,000 C.F.M.

Day Conditions

Dry Bulb Temperature.....	95°
Dew Point Temperature.....	72°
Latent Load	880,000 B.t.u.
Sensible Load	989,000 B.t.u.
Total Load	1,869,000 B.t.u.
Latent-to-total Ratio.....	47.1%
Air for Ventilation	15,000 C.F.M.

The night sensible load is the lightest sensible load which can exist when the space is occupied to capacity.

The outside air coil is selected at 500 f.p.m. face velocity, so that its face area will be

$$30 \text{ sq. ft. } \left[\frac{15,000}{500} \right]$$

From a base capacity chart, we find that a 13-inch coil, with entering air at 85° dry bulb and 72° dew point, face (Concluded on Page 27, Column 1)

BRUNNER

Send for the New
REFRIGERATION CATALOG

Five Models of Compressors
Forty-seven Models of Condensing
Units from ½ H.P. to 15 H.P.
BRUNNER MANUFACTURING CO.
UTICA, N. Y., U. S. A.

Dutch Liner Boasts Largest Conditioning System Afloat

NEW AMSTERDAM, Holland—The largest air-conditioning system afloat will be "on board" when Holland's new transatlantic "ship of peace," the *Nieuw Amsterdam*, is launched here April 10 by The Netherlands' Queen Wilhelmina on the River Maas, according to claims made by officials of the Holland-American Steamship line.

The new vessel has been termed the "ship of peace," because she stands alone among modern merchant shipping in that she carries no provisions for future machinery of war.

The *Nieuw Amsterdam* is scheduled to begin her transatlantic career in the spring of 1938 as flagship of the Holland-American line, plying between Rotterdam, Bologne, and New York.

Designed especially by Carrier for the requirements of the *Nieuw Amsterdam*, the air-conditioning equipment was shipped from Newark for installation here under the supervision of Carrier Continental, the Paris affiliate of the parent New Jersey firm.

Said to be 75 tons larger than the air-conditioning system of the *Queen Mary*, and 114 tons larger than the system for the *Normandie*, the 300-

ton air-conditioning system for the new 33,000-ton transatlantic giant will condition the liner's three dining rooms, its theater, and its barber shops.

The two Carrier centrifugal refrigerating machines which are used are of special construction to insure satisfactory operation regardless of any rolling of the ship in rough weather.

Seldes Host at Airtemp Dealer Meeting

OMAHA—The Seldes Co., Airtemp distributor, recently was host to a group of dealers and salesmen at the presentation of the 1937 air-conditioning line in this territory.

Factory representatives who took part in the presentation included H. C. Jamerson, regional manager; H. T. Waller, regional merchandise manager; and Gene Kelly, zone manager.

Pate Co. to Retail G-E In Birmingham

BIRMINGHAM, Ala. — Pate Co., plumbing concern, has been appointed General Electric air-conditioning dealer to replace James A. Smith Co.

— BUYER'S GUIDE —

SUPPLIERS WHO SPECIALIZE IN SERVICE TO THE INDUSTRY

"Commercial Controls?" —I'll Tell The World!"

CHECK WITH YOUR RANCO JOBBER—on the outstanding new developments in Temperature and Pressure Controls for commercial service. A great new field is opening up rapidly—and Ranco is out in front, as always! Count

Ranco
INC.

on Ranco—for Commercial Controls that ably meet today's demands!

Columbus, Ohio



— AIR CONDITIONING ENGINEERING —

Calculating Heat Loads For Inherent Control

(Concluded from Page 26, Column 5)
air velocity at 500 f.p.m., and average refrigerant temperature at 35°, delivers the following capacities per sq. ft. of face area.

	B.t.u.
Total	46,500
Sensible	16,400
Latent	30,100

For a coil with 30 sq. ft. face area, the results of a performance are as follows:

	B.t.u.
Total	1,395,000
Sensible	492,000
Latent	903,000

From the same charts we find that the daytime performance of the coil at 95° dry bulb and 72° dew point entering air temperatures will be:

	B.t.u.
Total	1,530,000
Sensible	645,000
Latent	885,000
Latent-to-total Ratio	64.7%

The recirculated air coil must have a sensible capacity equal to the difference between the maximum sensible load and the sensible capacity of the outside air coil during maximum sensible load conditions.

Since the maximum sensible load occurs at daytime, the recirculated air coil must have a sensible capacity of 344,000 b.t.u. (989,000—645,000). Choosing a shallow coil at 45° refrigerant temperature at room conditions in order to obtain a coil of light latent capacity, we read the following performance per sq. ft. face area at 500 f.p.m. face velocity from a base capacity chart.

	B.t.u.
Total	9,400
Sensible	7,400
Latent	2,000

Therefore, the recirculated air coil must have a face area of 46.5 sq. ft. [344,000 / 7,400]

The capacity of this coil will be:

	B.t.u.
Total	437,000
Sensible	344,000
Latent	93,000
HL/HT	21.3%

Comparing the night capacities of the outside air coil with the night load, we find that the coil will be able to care for the latent load, but that it will be necessary for the recirculated-air coil to cut in from time to time to help out on the sensible load. A comparison with daytime conditions shows a similar condition.

COMMONWEALTH FITTINGS
Built Right to Stay Tight
COMMONWEALTH BRASS CORPORATION
DETROIT

Case No. 1—Restaurant with Heavy Occupancy

Data	No Control	By-Pass Control	Inherent Control
Percent Sensible Reduction	35%	35%	35%
Entering DB Temperature	90°	90°	90°
Entering DP Temperature	67°	67°	67°
Sensible Load (B.t.u.)	60,000	60,000	60,000
Latent Load (B.t.u.)	40,000	40,000	40,000
Total Load (B.t.u.)	100,000	100,000	100,000
Latent-to-Total Load Ratio	40%	40%	40%
Inherent Sensible Factor (See Fig. 71)	...	...	99%
Inherent Latent Factor (See Fig. 71)	...	...	105%
Sensible Capacity Required (B.t.u.)	60,000	60,000	59,400
Latent Capacity Required (B.t.u.)	40,000	40,000	42,000
Total Capacity Required (B.t.u.)	100,000	100,000	101,400
Latent-to-Total Capacity Required	40%	40%	41.4%
Refrigerant Temperature Required	40°	40°	38°
Face Area of Coil Required (sq. ft.)	3.6	3.6	3.4
Cost of Coils	\$216.00	\$216.00	\$198.00
Cost of Humidity Control	\$0.00	\$61.50	\$0.00
Suction Pres. at Condensing Unit (lbs.)	32	32	30
Condensing Unit Horsepower	10	10	10
R.p.m. of Condensing Unit	470	470	500
Cost of Condensing Unit	\$716.20	\$716.20	\$716.20
Current Consumption (kwh.)	8.78	8.78	9.2
Water Consumption (g.p.h.)	815	815	845
Total Cost	\$932.20	\$993.70	\$914.20

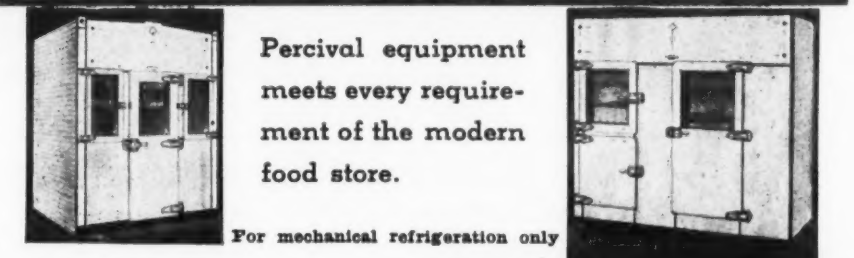
Case No. 2—Restaurant with Light Occupancy

Data	No Control	By-Pass Control	Inherent Control
Percent Sensible Reduction	50%	50%	50%
Entering DB Temperature	86°	86°	86°
Entering DP Temperature	63°	63°	63°
Sensible Load (B.t.u.)	70,000	70,000	70,000
Latent Load (B.t.u.)	30,000	30,000	30,000
Total Load (B.t.u.)	100,000	100,000	100,000
Latent-to-Total Load Ratio	30%	30%	30%
Inherent Sensible Factor (See Fig. 71)	...	...	95%
Inherent Latent Factor (See Fig. 71)	...	...	120%
Sensible Capacity Required (B.t.u.)	70,000	70,000	66,500
Latent Capacity Required (B.t.u.)	30,000	30,000	36,000
Total Capacity Required (B.t.u.)	100,000	100,000	102,500
Latent-to-Total Capacity Required	30%	30%	35%
Refrigerant Temperature Required	45°	45°	42°
Total Air Circulation (c.f.m.)	3,030	3,030	2,700
Face Area Coil Required (sq. ft.)	5.05	5.05	4.5
Cost of Coils	\$303.00	\$303.00	\$270.00
Cost of Humidity Control	\$0.00	\$61.50	\$0.00
Suction Pres. at Condensing Unit (lbs.)	37	37	35
Condensing Unit Horsepower	10	10	10
R.p.m. of Condensing Unit	420	420	445
Cost of Condensing Unit	\$716.20	\$716.20	\$716.20
Current Consumption (kwh.)	8.14	8.14	8.55
Water Consumption (g.p.h.)	810	810	830
Total Cost	\$1,019.20	\$1,080.70	\$986.20

Case No. 3—General Office

Data	No Control	By-Pass Control	Inherent Control
Percent Sensible Reduction	65%	65%	65%
Entering DB Temperature	80°	80°	80°
Entering DP Temperature	60°	60°	60°
Sensible Load (B.t.u.)	80,000	80,000	80,000
Latent Load (B.t.u.)	20,000	20,000	20,000
Total Load (B.t.u.)	100,000	100,000	100,000
Latent-to-Total Load Ratio	20%	20%	20%
Inherent Sensible Factor (See Fig. 71)	...	...	90%
Inherent Latent Factor (See Fig. 71)	...	...	146%
Sensible Capacity Required (B.t.u.)	80,000	80,000	72,000
Latent Capacity Required (B.t.u.)	20,000	20,000	29,200
Total Capacity Required (B.t.u.)	100,000	100,000	101,200
Latent-to-Total Capacity Required	20%	20%	29%
Refrigerant Temperature Required	50°	50°	45°
Total Air Circulation (c.f.m.)	4,610	4,610	3,600
Face Area Coil Required (sq. ft.)	7.7	7.7	6.0
Cost of Coils	\$462.00	\$462.00	\$360.00
Cost of Humidity Control	\$0.00	\$61.50	\$0.00
Suction Pres. at Condensing Unit (lbs.)	41.5	41.5	37
Condensing Unit Horsepower	10	10	10
R.p.m. of Condensing Unit	385	385	425
Cost of Condensing Unit	\$716.20	\$716.20	\$716.20
Current Consumption (kwh.)	7.82	7.82	8.25
Water Consumption (g.p.h.)	804	804	820
Total Cost	\$1,178.20	\$1,239.70	\$1,076.00

DISTRIBUTORS WANTED



Percival's complete line will increase your sales of electrical refrigeration equipment and offer added earnings.

Desirable territories still available. Write for complete information.

1886-1937

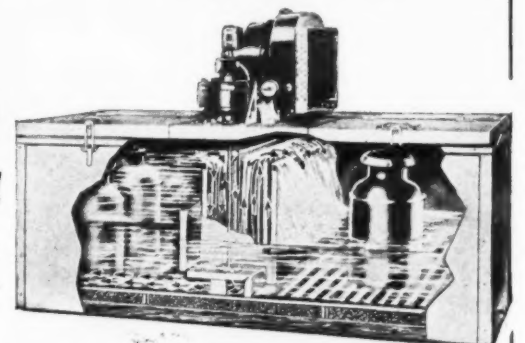
51 years of service to meat markets.

C.L. PERCIVAL CO.
DES MOINES, IOWA

Rapid Milk Cooling of NEW

ZERO-FLOW

Means Rapid
Dealer Sales



DEALERS find the new ZERO-FLOW sells itself. A single demonstration proves the extra convenience, economy and efficiency for the modern dairyman. ZERO-FLOW's new cooling principles will meet the strictest milk temperature requirements. Regardless of the number of cans, both evening's and morning's milk have constant level of flowing, icy-cold water, during cooling period, encircling cans up to their necks (made possible by revolutionary construction of Verti-Coil and Circulator in cooling compartment). ZERO-FLOW assures rapid cooling of milk to below 50° with minimum running time on compressor. ZERO-FLOW means rapid SALES for dealers because of exclusive cooling features never before available. Write for proposition today.

WILSON CABINET CORP.
114 MAIN ST. SMYRNA, DEL.



Dayton V-Belts are the logical choice for all types of appliances, because they provide silent, dependable transmission—because their powerful grip prevents slippage—because they run smoothly without weaving, twisting or vibrating. A nearby distributor carries a complete stock.

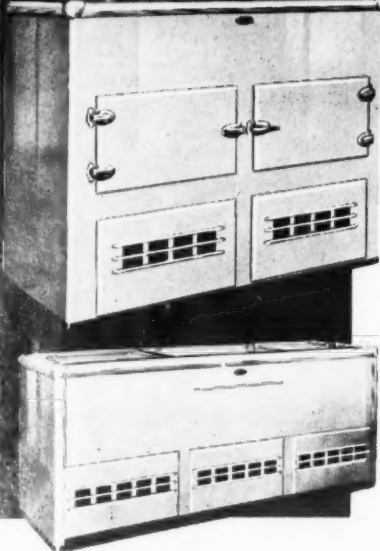
THE DAYTON RUBBER MANUFACTURING CO.
DAYTON, OHIO
WORLD'S LARGEST MANUFACTURER OF V-BELTS

Dayton
V-BELTS

BUYER'S GUIDE

SUPPLIERS WHO SPECIALIZE IN SERVICE TO THE REFRIGERATION AND AIR CONDITIONING INDUSTRIES

PELCO makes FLOATING ICE . . . and SELLS FASTER because it COOLS FASTER!



Universally accepted and respected for high quality and economic operation, PELCO is today the most talked of and fastest selling line on the market.

Theswing is to PELCO—because it's first in sales, first in quality, first in profit.

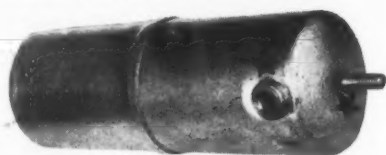
PELCO makes its own floating ice—cools bottled beverages from room temperature to desired degree in 30 minutes.

GET the FACTS on PELCO—get behind it for real PROFIT in '37. Write Dept. A-47.

Refrigerator Division
PORTABLE ELEVATOR MFG. CO.
BLOOMINGTON, ILL. 61820
304 E. 43TH ST., N. Y. CITY Cable Address: CARMUSE-N. Y.

BRAZED IN CONTROLLED ATMOSPHERE

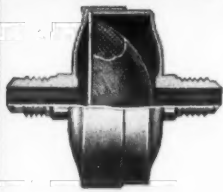
This receiver tank is made with special stampings brazed in a controlled atmosphere electric furnace. This process is the newest of our facilities for producing Pressed Metal Products. We furnish stampings, assemblies, hydrogen brazing and enameling. Stamped compressor bases are one of the many items we supply. Check us for prices.



Acklin

THE ACKLIN STAMPING CO.
Toledo, Ohio Chicago, Illinois
Detroit, 2-165 General Motors Bldg.

HENRY



Write for Catalog
62: Dryers, Strainers,
Valves and
Service Tools.

Small Strainer TYPE 890

Hemispherical screen has 70% more capacity than usual flat disc. Soldered brass shell. 120 mesh screen with No. 10 mesh brass screen reinforcement. Screen area, 4 sq. in. O. D. of shell 2 in. Weight 4 oz.

HENRY VALVE CO. 1001 19th St., CHICAGO, ILL.
Stocked By Leading Jobbers

SHELL AND TUBE CONDENSERS AND WATER COOLERS



CLEANABLE

ALL SIZES
EFFICIENT
FAST
DEPENDABLE
COMPACT

ECONOMICAL OPERATION

ACME INDUSTRIES, INC.

JACKSON

MICHIGAN

A NEW DEHYDRATOR FOR THOSE BIGGER JOBS



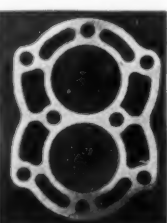
THE new Imperial steel dehydrator is designed for refrigeration and air conditioning work. It has a steel shell with bolted flanged end. The shell is 4 inches in diameter and is furnished in 18, 24 and 36 inch lengths. Ends have 1 1/2 inch female iron pipe thread and screens and steel wool are included.

IMPERIAL BRASS MFG. CO., 565 S. Racine Ave., Chicago

Other dehydrators have been added to the Imperial line, including a refillable cartridge type, another with dispersion tube and a very small, inexpensive size for permanent installation on small systems. Write for the new Imperial refrigeration catalog.

IMPERIAL Dehydrators
VALVES • FITTINGS • TOOLS • CHARGING LINES • STRAINERS • FLOATS

ORDER FROM YOUR JOBBERS



PIONEERS and SPECIALISTS in

GASKETS for ELECTRIC REFRIGERATION

offer you Metallic Gaskets that hold regardless of what your refrigerant may be and will not shed particles of material to clog up important working parts in a machine. A metal that will not "creep." Once tight it will stay "tight."

"Send for NEW complete catalog"

CHICAGO-WILCOX MFG. CO.

7701 S. AVALON AVE.

CHICAGO, ILL.

Nema-Approved Test Code for Household Refrigerators Mechanically Operated

GENERAL STATEMENT

1. The cabinet and refrigerating mechanism shall be assembled and set up exactly as they would be installed in service and as nearly as practicable in accordance with the intentions of the manufacturer so far as stated or known. Ice trays, defrosting trays, and all permanently located accessories shall be in their proper places during all tests, except as limited by the test conditions herein stated. Ice trays shall be empty unless otherwise specified.

2. Before the refrigerator is put on test it shall have had a "run in" period of at least twenty-four (24) hours or sufficient to assure a thorough working in of mechanical parts and equilibrium distribution of oil in the system. A "run in" period of one week is recommended. "Run in" shall be construed as meaning as near 100% operating time of the refrigerator as possible at any convenient room temperature.

3. The refrigerator shall be operated at test conditions at a given ambient temperature for a sufficient length of time to establish thermal equilibrium and then for the additional period specified as the test period during which the desired elements of performance are determined by observation or by measurement.

4. When this Test Code is used for determining conformity with purchase specifications, each specimen tested shall be selected from stock or routine factory production and shall be representative as to construction and adjustment. A representative of the manufacturer or of his authorized servicing agency shall have the opportunity to install the refrigerator in the testing space and to make such adjustments as are normally made in a routine installation on a purchaser's premises.

CONDITIONS FOR THE REFRIGERATOR TEST

5. Circulation of air about the refrigerator under test shall be restricted by vertical false partitions. A rear partition shall be placed adjacent to spacers, if provided at the rear of the cabinet, but not less than 2 1/2 inches from the rear wall of the cabinet. Vertical side partitions shall extend one (1) foot from the rear partition and shall be placed one (1) foot from the sides of the cabinet. The partitions shall extend vertically from the floor to a point not less than one (1) foot above the top of the cabinet or unit whichever may be higher.

6. The rear partition shall be placed far enough away from all other objects in the hot room to eliminate any danger of the partition being at a temperature other than the ambient.

7. The refrigerator shall be so placed or shielded to prevent direct radiation to or from the cooling or heating equipment. Air circulation in the room shall be such that the specified uniformity of temperature distribution is obtained without a direct draft upon the refrigerator under test. Windows in the test room shall be provided with suitable radiation shields. The refrigerator shall be shielded from forced air currents which exceed 50 feet per minute.

INSTRUMENTS

8. All instruments used in taking data shall be checked before and after each series of tests against a secondary standard. The average corrections obtained in these checks shall be used to correct the test data.

9. Temperature measuring instruments shall be accurate and readable to 0.5 F.

10. Watt-hour meters shall be accurate and readable to 0.01 kwh.

11. The operating time of the unit shall be obtained by means of a recording meter or a synchronous self-starting electric clock.

TEST SPECIFICATIONS

12. The specifications to be observed in making standard tests follow:

(a) STANDARD TESTS

Test Designation	Ambient Temperatures		
	70 F	90 F	110 F
No Load	x	x	x
Ice Making			
(Advertised Charge)	x	x	x

Load Test

(To be added later)

(b) TEMPERATURE CONTROL POSITIONS

13. The tests described in this code will require that the temperature control be set in various positions as follows: Warmest, middle, coldest, and standard.

14. The warmest and coldest positions will be at the extreme ends of the temperature adjustment scale, the middle position being as nearly midway as possible. This position is taken to afford three points for curve data.

Standard position is defined as that setting which under no load conditions (Section II) will produce an average cabinet air temperature of 38 F at 70 F, 43 F at 90 F and 46 F at 110 F ambient.

15. The defrost position is not to be used for the purpose of obtaining test data.

(c) AMBIENT TEMPERATURE

16. Ambient temperatures shall be maintained within plus or minus 1 F of the specified values and shall be measured at points located three (3) feet from the floor and ten (10) inches from the sides and front of the cabinet. This condition shall be maintained during stabilization periods as well as during actual test runs.

17. The ambient temperature may be measured with thermocouples, resistance thermometers or glass thermometers. The temperature sensitive part of the thermometric device shall be in good thermal contact with such a mass as to make the total heat equivalent not less than ten (10) grams or more than twenty (20) grams of water.

18. The ambient temperature shall be recorded at one of the above positions, preferably with a recording instrument. If an indicating instrument is used, readings shall be taken at intervals not greater than thirty minutes.

19. The vertical temperature gradient from the floor to a height of seven (7) feet shall not exceed 0.5 F for each foot of vertical distance.

(d) INTERNAL CABINET AIR TEMPERATURES

20. Cabinet air temperatures shall be recorded in the positions shown in Supplement A.

21. The average cabinet air temperature used as a basis for reporting data shall be the average of all temperature readings taken in the food compartment.

22. When separate frozen food compartments are used, their temperatures at the center of the food compartment shall be recorded and reported separately.

23. Internal temperatures shall be taken with either thermocouples or resistance thermometers. The thermocouples or resistance thermometers shall be in good thermal contact with such a mass as to make the total heat equivalent not less than ten (10) grams or more than twenty (20) grams of water. All temperature measuring elements shall be supported in the refrigerator in such a manner that there will be at least 1/2 inch of air space separating the thermal mass from contact with heat-conducting surfaces in the refrigerator.

24. Leads from the thermocouples or resistance thermometers shall be brought outside the cabinet in such a manner as to interfere as little as possible with air seals.

25. Temperatures may be recorded graphically, or may be taken with an indicating potentiometer at regular intervals as specified under the Section II No-Load Test and Section III Ice Making Test.

(e) STABILIZATION AND DURATION OF TESTS

26. Before the start of any test the refrigerator must be allowed to operate at test condition for a sufficient length of time to establish equilibrium. When the ambient temperature has been changed, this period of stabilization shall be at least twelve (12) hours, and when the cabinet temperature has been changed but the room temperature held constant, this period of stabilization shall be at least six (6) hours.

27. Equilibrium shall be considered to be established when the average cabinet air temperature does not vary more than 0.5 F in the last two

(2) hours of the stabilization period. 28. The final test period unless otherwise stated shall be twenty-four (24) hours in length, but may be shortened where thermal stability and uniformity of performance are assured.

(f) ELECTRIC POWER SUPPLY

29. In all tests the electric power supply shall be 60 cycles at a voltage of 115 plus or minus 2.

REPORT FORMS

30. The following forms shall be used in preparing reports of the test data obtained. Specimen forms are attached to this code for guidance. Supplement B—Plot of no-load test data. Section II.

Supplement C—Plot of average cabinet air temperature during ice making tests. Section III.

Supplement D—Report sheet recording required test data. Sections II and III.

PURPOSE

40. The purpose of this test is to determine the electrical energy consumption in kwh. per twenty-four (24) hours, the percent operating time of the unit, and the average cabinet air temperature in various ambient temperatures with the temperature control adjusted to selected positions.

CONDITIONS OF TEST

41. The general conditions shall be as outlined in Section I.

42. The evaporator shall be defrosted and the defrosting trays and the interior of the cabinet dried immediately before the stabilization period preceding the series of tests at a given ambient temperature.

43. The cabinet door shall be kept closed during each test.

DATA TO BE REPORTED

44. The following data are to be reported for each test:

(a) Ambient temperature.
(b) Temperature control position.
(c) Average cabinet air temperature.

(d) Kwh. per twenty-four (24) hours.

(e) Percent running time.

45. The following data for "standard" setting shall be reported. This data may be determined separately or taken from the curves (Supplement "E").

(a) Ambient temperature 70 F 90 F 110 F

(b) Average cabinet air temperature 38 F 43 F 46 F

(c) Kwh. per 24 hours.

(d) Percent operating time.

PROCEDURE

46. Equilibrium temperature shall be established as outlined in Section I, Stabilization and Duration of Tests on Page 8.

47. Data shall be recorded for a period of at least twelve (12) hours, taking a complete number of cycles, i.e., an equal number of "off" periods and "on" periods, to obtain the percent operating time and the kwh. consumption per twenty-four (24) hours.

48. The average cabinet air temperature shall preferably be taken with a recording instrument and shall be averaged over the entire test period. In case a temperature recording instrument is not used, the maximum and minimum average cabinet air temperatures of a cycle shall be measured for a minimum of at least one (1) hour and/or not less than two (2) complete cycles at the beginning and at the end of the test period. The average of maximum and minimum average cabinet air temperatures shall be reported as the average cabinet air temperature. The average cabinet air temperature drift through the test period shall not exceed 0.5 F.

49. Make tests at each ambient temperature with the temperature control adjusted to the warmest position. (Concluded on Page 30, Column 4)

TEMPRITE

INSTANTANEOUS
WATER COOLERS

Michigan



Known

wherever refrigerants
are controlled

Supplement A (to Nema Test Code)

LOCATIONS FOR TEMPERATURE INSTRUMENTS IN CABINET

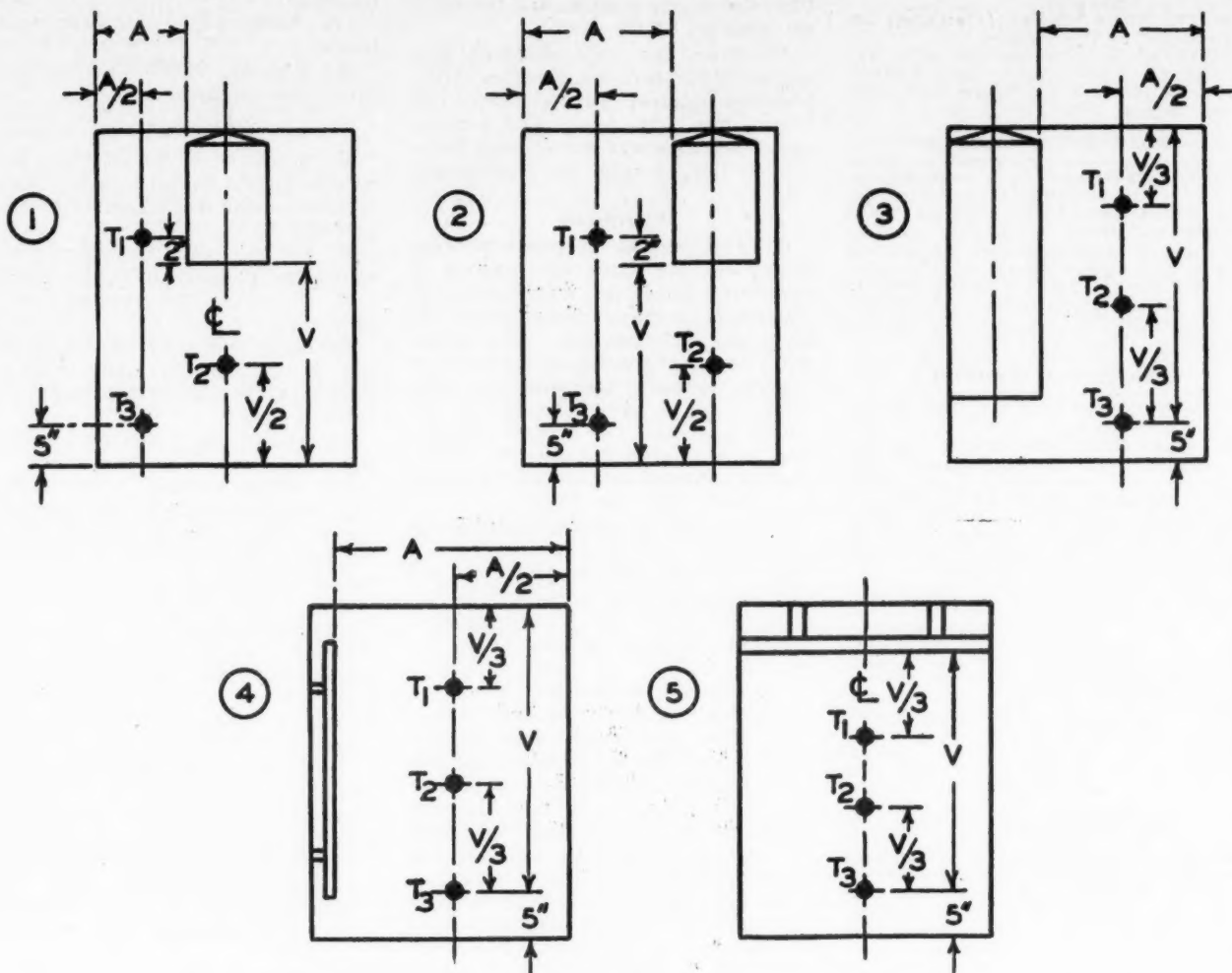
All temperature instruments located midway between front and back.

Temperatures T_1 , T_2 , and T_3 shall be averaged and reported as T_a .

1. Cabinets with center cooling unit.
2. Cabinets with side cooling unit.

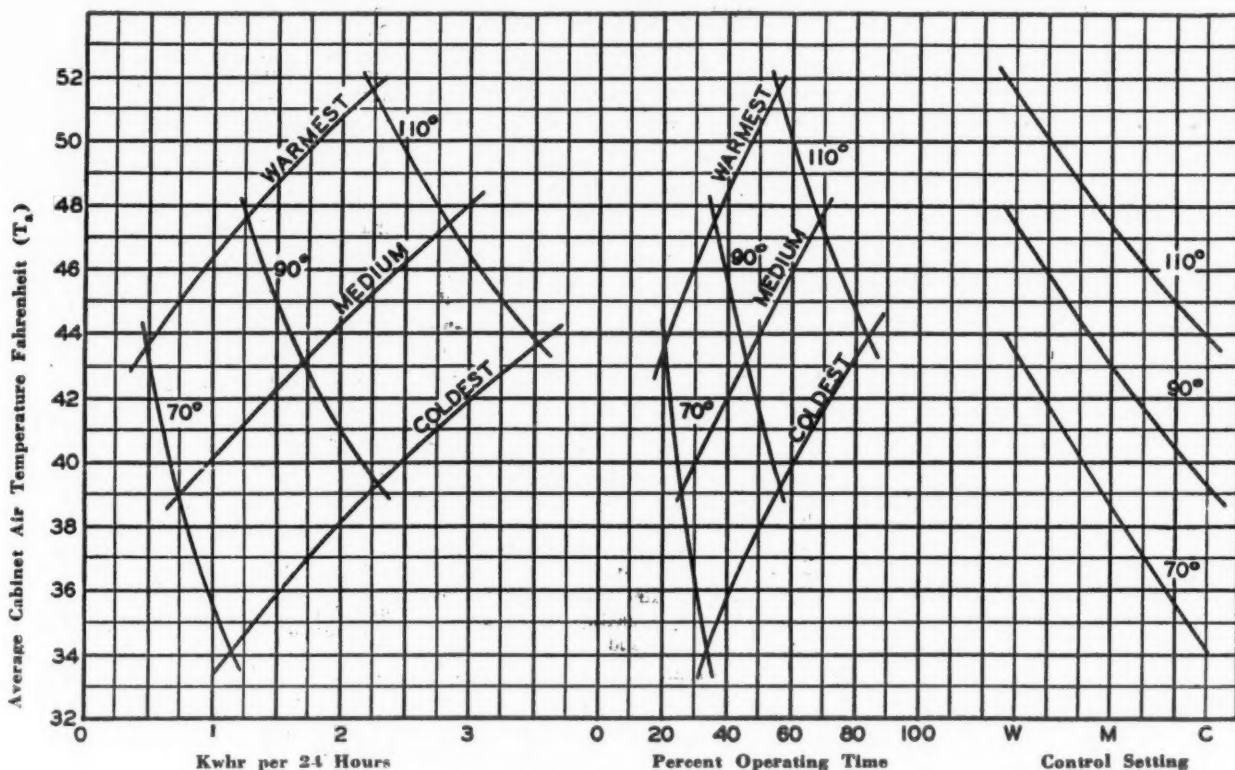
3. Cabinets with side cooling unit (full length evaporator).

4. Cabinets with side cooling unit (full length cooling plate).
5. Cabinets with top cooling unit.



Supplement B

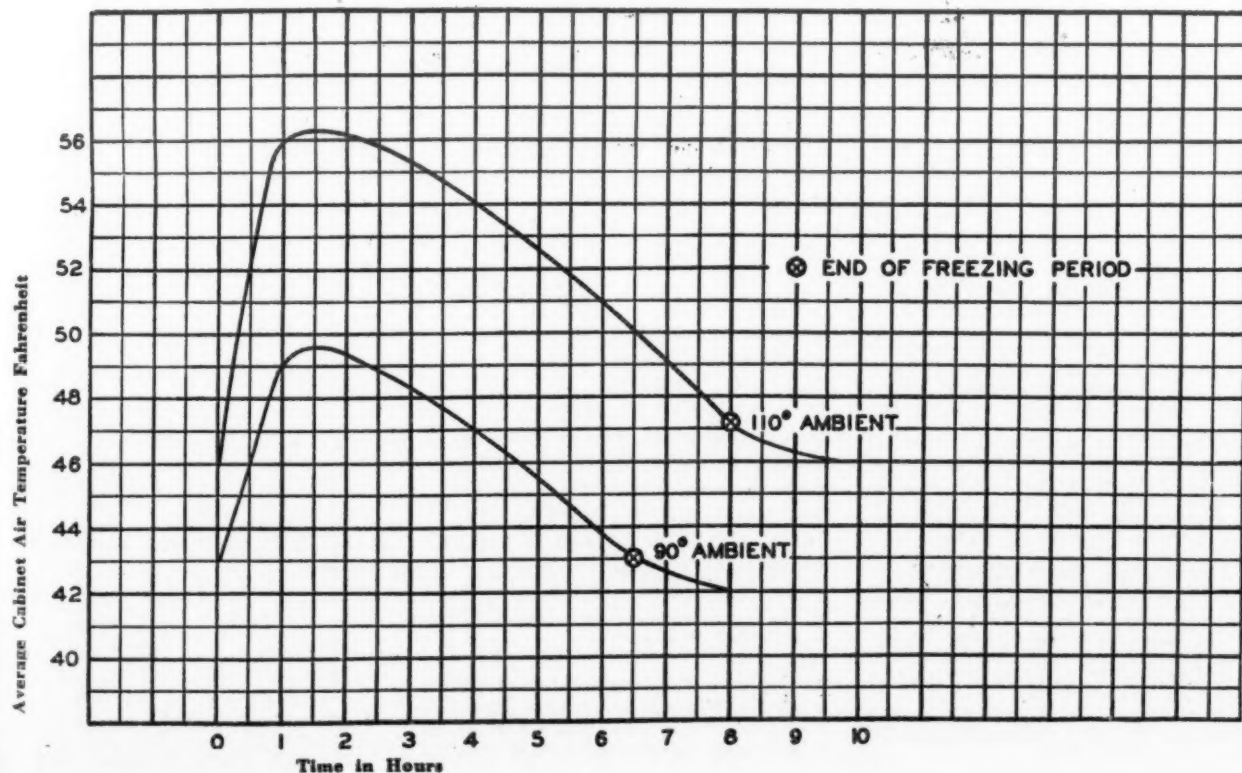
Test Results—Section 2 No Load Tests



Supplement C

Ice Making Tests—Section 3

Average Cabinet Air Temperature During Freezing Period



BUYER'S GUIDE

SPECIAL RATES APPLY TO THESE COLUMNS ONLY
WRITE ADVERTISING DEPT. FOR FULL INFORMATION

REACH-IN BOXES for GROCERIES . . . RESTAURANTS . . . INSTITUTIONS

Available in two lengths and any desired door arrangement, either glazed or solid, using three standard door sizes. Another of the profit-making items in the extensive Sherer line.

Addition of the Sherer Case and Cooler Franchise to your present line is your move for '37. Desirable territories still available. Write us for details.



The Real Heavy Duty Refrigerator!

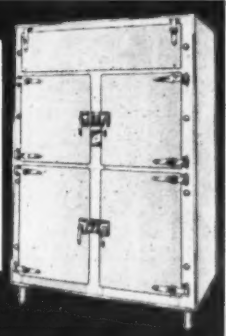
MODEL 354—the beautiful Heavy Duty Refrigerator for lunch rooms, schools, hospitals, hotels, etc., combining GREATER CAPACITY, beautiful finish and Heavy Duty Construction.

This Refrigerator is built in sections, and may be supplied in various door combinations and shelf arrangements to meet your needs. A real Heavy Duty Refrigerator—sturdy, beautiful, enduring!

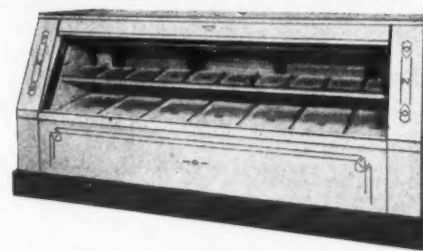
White porcelain finish, fused on 18 gauge special steel, bronze chromium finish hardware, and 3" corkboard insulation. Also available with oak exterior and galvanized interior.

Write for Descriptive Bulletin.

GLOEKLER MANUFACTURING COMPANY
ERIC, PENNSYLVANIA
SALES OFFICE: 60 FIFTH AVENUE, PITTSBURGH



NATIONAL DOUBLE DUTY CASES



Require less service due to extra heavy construction and cork insulation, roomier than other cases, porcelain inside and outside, storage compartment doors 6" thick, chromium hardware. Purchase one for testing purposes, then compare results with other makes. You will purchase more National Cases. Sold with or without coils or platters, prices very attractive. Dealers wanted, few territories open.

NATIONAL REFRIGERATOR CO., Philadelphia, Pa.



TYLER'S WELDED STEEL Cases

1937 line offers wide variety and sensational values. 6 big new features and iron-clad guarantee. Only Tyler gives one-piece "welded steel" construction, 100% insulation. Wonderful sales opportunity. Most talked of and fastest selling line on market. WRITE today.

TYLER Sales-Fixture COMPANY
Dept. E, NILES, MICHIGAN

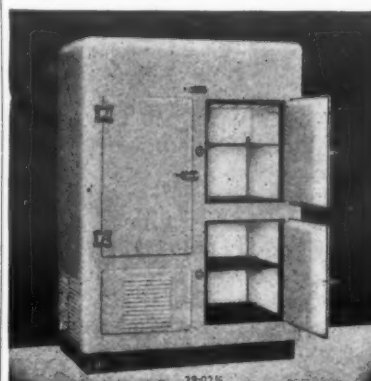
SIX BIG NEW FEATURES



PURO ELECTRIC WATER COOLERS

Thoroughly reinforced all steel attractively finished cabinets.
Complete line of different Models and Capacities.
Write for details and sales prices.

Puro Filter Corporation of America
440 Lafayette Street, New York City Spring 7-1800

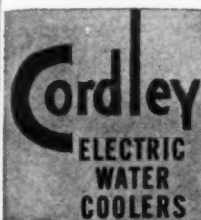


Streamlined Beauty THIS LINE SELLS ON SIGHT

Weber brings the result of 35 years of successful manufacturing experience . . . America's most beautiful line of Refrigerator Cases and Commercial Cabinets. Exclusive territories now open—Complete financing plan.

Established 1902 Cable Address "Weberco."

WEBER SHOWCASE & FIXTURE CO., INC.
5700 Avalon Boulevard Los Angeles



A complete line of both pressure and bottle types

THERE'S a large and profitable market for water coolers ready and waiting. The Cordley line is ideal for reaching that market . . . the cabinets simple in design, attractive and compact . . . the cooling mechanism efficient, dependable and trouble-free. Best of all, Cordley coolers are easy to sell . . . for they are inexpensive in first cost and easy on the electric bill. Generous margin of profit to dealers. Ask us for full information. Cordley & Hayes, 141 Hudson St., N.Y.

WATER COOLERS SINCE 1889

BUYER'S GUIDE

SUPPLIERS WHO SPECIALIZE IN SERVICE TO THE REFRIGERATION AND AIR CONDITIONING INDUSTRIES

A NEW Market **REMANUFACTURED (RECONDITIONED)** **A NEW Field**

FRIGIDAIRE - KELVINATOR - GENERAL ELECTRIC - ELECTROLUX - NORGE & others

FOR EXPORT and DOMESTIC USE

Dealers! Build Store Traffic—Reach the lower income bracket buying group with Federal Remanufactured—Nationally Advertised—used Refrigerators. Rebuilt from top to bottom. That's why they look like new and most important "work like new" and carry our 1 Year full guarantee.

Starting at \$30

FEDERAL REFRIGERATOR CORP.
57 EAST 25th ST., NEW YORK CITY
References: Dun & Bradstreet—Nat'l City Bank

Expert REBUILDING & REPAIR

General Electric MONITOR \$25
All Household Models

MAJESTIC HERMETIC UNITS—\$20.50
SERVEL HERMETIC UNITS—\$18.50

P.O.B. OUR FACTORY
One Year Unconditional Guarantee

A complete rebuilding and replacement service. All units tested for temperature, cycling, wattage consumption and quietness. Thousands of units rebuilt in past seven years. We guarantee satisfaction.

REFRIGERATION MAINTENANCE CORP.
115 EAST ILLINOIS ST. — CHICAGO, ILLINOIS

PARTS-SUPPLIES-TOOLS
for REFRIGERATION-AIR CONDITIONING

Complete Stock—Quick Service

One-day service on your order for any parts, supplies or tools you may need for any type of refrigerator or air conditioner. **QUALITY MERCHANDISE**, absolutely guaranteed and offered at the lowest prices. Deal with us—obtain all your needs from one source—and rely absolutely on getting exactly what you order. **WHOLESALE ONLY** for your protection. Request big, complete, new catalog on your business card or letterhead. It's FREE.

AIRO SUPPLY CO. 2732 N. Ashland Ave., CHICAGO
17 West 60th Street, NEW YORK

SEND FOR BIG FREE CATALOG

ALL YOUR NEEDS FROM ONE SOURCE

CATALOG NO. 11
INTRODUCES

THE GREAT CHANCO HIGHSIDE

GET ALL DETAILS — WRITE ON YOUR LETTERHEAD
H. CHANNON CO.

133 N. WACKER DRIVE CHICAGO TEL. FRANKLIN 0380

"SUPPLIES — TOOLS — EQUIPMENT — PARTS"

SAVE UP TO 20% BUY FROM

WRITE FOR 164 Page Catalog of BARGAINS
16 COMPLETE STOCKS—One as close as Your Telephone
ONE STOP SERVICE—Refrigeration—Electric—Hardware—Motors
18 ENGINEERS at YOUR SERVICE—Let us engineer your jobs
1/2 H.P. Refrigerator Motor. A real bargain at \$7.95 net
WE PAY NO RETAIL TAX Because we sell Dealers only
SPECIAL OFFER—\$1.00 Tester and \$2.50 Flaring Tool both for \$1.99

Atlanta—Boston—Chicago—Cincinnati—Cleveland—Dallas—Detroit
Kansas City, Mo.—Los Angeles—Minneapolis—New York
Philadelphia—Richmond—San Francisco—Seattle—St. Louis

W.W. GRAINGER INC. GRAINGER BLDG.
825 CONGRESS ST. CHICAGO

ICE CREAM CABINETS

The Most Complete Line of Ice Cream Cabinets in the Industry

BUY YOUR CABINETS DIRECT FROM THE MANUFACTURER

With or without compressors. Will operate using either Freon, Methyl Chloride or Sulphur Dioxide

Schaefer MINNEAPOLIS MINNESOTA Est. 1929

WRITE OR WIRE FOR YOUR CATALOG TODAY

Write for this FREE book

of Commercial Refrigeration Controls

Condensed catalog gives full description of 9100 Refrigeration Controls of pressure, vacuum and temperature types . . . this booklet will be mailed to you postpaid on request.

SQUARE D COMPANY

CLASSIFIED ADVERTISING

RATES: Fifty words or less, one insertion, \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning and Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

POSITION AVAILABLE for engineer capable of writing, developing, and supervising correspondence course in air conditioning and refrigeration. Also openings available for teacher in day and evening sessions of various phases of air conditioning, refrigeration, and drafting. Write only, giving qualifications, etc. TECHNICAL INSTITUTE, 244 W. 14th St., New York City.

POSITIONS WANTED

REFRIGERATION SERVICE ENGINEER. Several years' experience with all models Kelvinator, also 10 other makes, domestic, commercial, and air-conditioning. Can figure cooling and heating loads. Wide experience with automatic heating. Honest, dependable, ambitious, no boomer. Have tools and car. Will go anywhere. Located now in middle west. Box 911, Air Conditioning and Refrigeration News.

EXPORT: Engineer, 32, American, with technical and export experience in household and commercial refrigeration, market analyses, distributor selection, foreign merchandising, American buying. Widely traveled, fluent German, some French. Seeks connection with outstanding organization in America or Europe offering future. Will travel or reside abroad. Employed at present. Box 913, Air Conditioning and Refrigeration News.

EQUIPMENT FOR SALE

MAJESTIC SURPLUSES. 1000 complete conventional and hermetic type units as is \$15.00. New evaporators \$4.00. New Majestic capacitor motors \$4.50. New refrigerator shelves \$5.00 hundred. New copper gas condensers \$2.00. Electrolytic condensers 75¢. 2 hour test cabinets with air lifts and Bristol records \$7.50. 3/16" tinned copper tubing 30¢ lb. Discounts on quantities. G & G COMPANY, 5801 Dickens, Chicago.

EXPORTERS, Case and Service men—Frigidaire and Kelvinator compressor units 1/2 H.P. to 1 1/2 H.P. air or water cooled thoroughly overhauled or not as you wish. Guaranteed against moisture. Have large assortment used flings and 2-trd evaporators also panel valves. KENMORE ENGINEERING CO., INC., 82 Brookline Ave., Boston, Mass.

TWO MAJESTIC units and two Servel units, in crates, good condition, all four for \$30.00, f.o.b. Belleville, Illinois. WALTER L. RHEIN, Belleville, Illinois.

REPAIR SERVICE

MAJESTIC AND GRIGSBY-GRUNOW refrigerator and radio parts service. We have purchased all of the original Grigsby-Grunow Majestic refrigerator and radio parts service. We are the only original, the only genuine, the only direct factory parts and service anywhere in the world. Beware of inferior replacements and parts. Everything we sell is factory guaranteed. Send for prices and dealerships. G & G GENUINE MAJESTIC REFRIGERATOR & RADIO PARTS SERVICE, 5801 W. Dickens Ave., Chicago.

CONTROLS REPAIRED for the refrigeration and air-conditioning trade. Any make, almost any type. Every control individually calibrated. Steam traps, packless valve glands, and regulators repaired. If it contains a bellows, Hallectric can repair it. Service prompt, prices right, guarantee reliable. HALLECTRIC LABORATORY, 1793 Lakeview Road, Cleveland, Ohio.

MAJESTIC — GENERAL ELECTRIC — SERVEL hermetic units repaired and exchanged. Majestic—\$20.50—General Electric—\$25.00—Servel—\$18.50 F.O.B. our factory. One year unconditional guarantee. Every unit undergoes complete tests for temperature, cycling, wattage consumption and quietness on genuine test equipment. See our advertisement this issue under "Buyer's Guide". REFRIGERATION MAINTENANCE CORP., 365 E. Illinois St., Chicago, Ill.

GENERAL ELECTRIC and Majestic hermetically sealed units repaired and exchanged. Guaranteed work. Wholesale only. Give model when writing. All prices quoted f.o.b. Chicago. AMERICAN REFRIGERATING ENGINEERS, INC., 2267 Silverton Drive, Chicago, Illinois.

SCHOOLS

ATTENTION, SERVICE MEN! Write for particulars concerning our extension course designed especially to give you a thorough knowledge of the technical part of refrigeration and air conditioning. For men with no refrigeration experience, we recommend our resident course. DETROIT SCHOOL OF REFRIGERATION AND AIR CONDITIONING, 4125 Grand River Ave., Detroit, Mich.

STUDY REFRIGERATION ENGINEERING. A new, personally supervised Home-Study course. Recently copyrighted. Lessons comprise text, illustrations, blueprints; all to make subjects and problems easily understood. Acquire a theoretical knowledge of refrigeration engineering. For details write FEDERAL INSTITUTE OF REFRIGERATION ENGINEERING, 712 N. Latrobe Ave., Chicago, Ill.

ARTIFICIAL FOOD DISPLAYS

MANUFACTURERS of artificial fruits, vegetables, meats. Over fifty pieces from which to select, including full size Turkey, Capon, Chicken, and Watermelon. Sets to accommodate every make of refrigerator. Reasonable prices ranging from \$2.75 to \$9.00 per set. Write for complete data. ROMAN ART CO., INC., 2704 Locust Blvd., St. Louis, Mo.

No-Load and Ice-Making Tests Are Prescribed in Nema Test Code

(Concluded from Page 28, Column 5)

tion, the middle position and the coldest position of the scale.

59. From the data obtained plot curves of ambient temperature, temperature control setting, kwh. per twenty-four (24) hours and percent operating time against average cabinet air temperature. See Supplement "B."

PURPOSE

60. The purpose of this test is to determine the time of freezing a complete charge of water and the electrical energy consumption in kwh. per twenty-four (24) hours when the refrigerator is operated in various ambient temperatures with temperature control adjusted to selected positions. The purpose of this test is also to determine the variation of average cabinet air temperature throughout the test.

61. General conditions shall be as outlined in Section I.

62. The ice trays supplied by the manufacturer shall be used.

63. Distilled water at the ambient temperature shall be used in all ice making tests.

64. The full advertised charge of water shall be frozen in each test.

65. The evaporator shall be defrosted and the evaporator and the interior of the cabinet dry except that the surfaces of the cooling unit on which the trays rest shall be wetted at the time the trays are inserted in order to insure a good contact.

66. The cabinet doors shall be kept closed except when visual inspection of the ice is necessary and then shall not be open for more than 15 seconds at a time.

TESTS AND DATA TO BE REPORTED

67. The following tests are to be made:

(a) With temperature control set at standard position determine time required to freeze each tray of water and kwh. over a twenty-four (24) hour period with refrigerator in 70 F ambient.

(b) With temperature control set at standard position determine time required to freeze each tray of water, kwh. over twenty-four (24) hour period, and plot average cabinet air temperatures against time during the freezing period, with the refrigerator in 90 F and 110 F ambient. If the temperatures are recorded manually they shall be taken at thirty minute intervals. See Supplement "C."

(c) With temperature control set at coldest position determine time required to freeze each tray of water with the refrigerator in 90 F and 110 F ambient.

68. The following data are to be reported for each test:

(1) Time required to freeze water in each tray, indicating the material of the tray and grid.

(2) The pounds of ice per tray.

(3) The total pounds of ice per freezing.

(4) Kwh. per twenty-four (24) hours.

(5) Average cabinet air temperature. (See paragraph b).

PROCEDURE

69. Equilibrium temperature shall be established as outlined in Section I, Stabilization and Duration of Tests on Page 8.

70. Fill the trays to capacity with water and place them in the freezer.

71. Determine the freezing time of each tray.

72. Each test shall be twenty-four (24) hours in length. Any trays not frozen at the end of this time shall be so reported.

73. One of the following ice making procedures is recommended:

(a) Visual method. A preliminary test shall be made to determine the approximate freezing time so that in the final test the door need be opened very few times.

(b) Thermocouple method. One thermocouple shall be used in each tray. The thermocouple wires shall not be larger than No. 20 AWG. The thermocouple junction shall be placed in the cell judged to be the last to freeze. The water shall be considered to be frozen when the temperature, as indicated by the thermocouple, has dropped to 23 F after the constant temperature of the freezing period.

74. Data shall be recorded during the entire twenty-four (24) hour period to obtain the kwh. consumption per twenty-four (24) hours.

New Building for G-E Home Laundry Dept.

BRIDGEPORT, Conn.—The home laundry manufacturing, warehousing, and commercial divisions of General Electric Co. here are being moved into a separate building group recently acquired from the Remington Arms Company, Inc., it has been announced by C. E. Wilson, vice president in charge of the company's appliance and merchandise activities.

The new unit consists of six buildings comprising 250,000 sq. ft. of space. It will also house warehousing facilities for other Bridgeport lines and will constitute the headquarters for General Electric Supply Corp.

The home laundry division will occupy approximately 100,000 sq. ft., and will represent one of the largest home laundry equipment manufacturing plants in the East. Both parts-making and assembly will be included in the division, together with storage, and sales and advertising offices.

For the first time since General Electric began the manufacture and sale of this line of equipment, all related facilities from design to warehousing will be incorporated in a single unit. The buildings are located directly across the street from the present works.

It is estimated that three months will be needed to complete the move.

Supplement D

Test Report

Mechanically Operated Domestic Refrigerators Refrigerator Tested

Make and Model

NEMA Cu. Ft.: Manufacturers' Rating _____ As Measured _____

NEMA Sq. Ft.: Manufacturers' Rating _____ As Measured _____

No-Load Tests—Section 2

Ambient Temperature	70 F	90 F	110 F
Temperature Control Position	W M C S	W M C S	W M C S
Average Cabinet Air Temperature..	— 38 —	— 43 —	— 46 —
Kwh. per 24 hours	— — —	— — —	— — —
Per Cent Operatig Time	— — —	— — —	— — —

Print attached showing data as in Supplement "B."

Additional Notes:

Ice-Making Tests—Section 3

Ambient Temperature	70 F	90 F	110 F
Temperature Control Position	S	S C	S C
Kwh. per 24 hours	—	—	—
Total Pounds of Ice Made	—	—	—
Time Required to Freeze Tray No. 1, etc...	—	—	—
Pounds of Ice—Tray No. 1	—	—	—
Tray Material—Tray No. 1	—	—	—
Grid Material—Tray No. 1	—	—	—

The last four items shall be reported for each tray. A sketch shall be made showing the location of each tray in the freezer.

A print shall be attached showing average cabinet air temperature during freezing period as indicated in Supplement "C."

Additional Notes:

Note.

W—Warmest Temperature Control Position
M—Middle Temperature Control Position
C—Coldest Temperature Control Position
S—Standard Temperature Control Position

- PATENTS -

Issued March 16, 1937

2,073,651. CONVERTIBLE HEATING AND COOLING SYSTEM. Bo Folke Randel, San Diego, Calif. Application Feb. 10, 1936, Serial No. 63,172. 1 Claim. (Cl. 257-9. (Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

2,073,656. REFRIGERATING APPARATUS. Carl A. Stickle, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio. Application Oct. 31, 1934, Serial No. 750,869. 3 Claims. (Cl. 62-4)

2,073,677. TEMPERATURE REGULATING SYSTEM. Frederick C. Broderick, Winnetka, Ill. Application March 16, 1935, Serial No. 11,436. 4 Claims. (Cl. 257-3)

2,073,700. DEVICE FOR USING SOLID REFRIGERANT TO EFFECT RAPID COOLING OF SMALL ENCLOSED SPACES. Lester S. Keilholz, Detroit, Mich. Application March 22, 1934, Serial No. 716,827. 6 Claims. (Cl. 62-91.5)

2,073,732. WATER COOLING ATTACH-

MENT. Alvin L. Cosner, Akron, Ohio. Application Jan. 20, 1936, Serial No. 59,970. 1 Claim. (Cl. 62-43)

2,073,741. REFRIGERATING APPARATUS. J. Lowell Gibson, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corp. Application Sept. 30, 1930, Serial No. 485,446. 4 Claims. (Cl. 62-116)

2,073,757. THERMOSTATIC SWITCH. Timothy A. Schaefer, Milwaukee, Wis. Application Dec. 11, 1933, Serial No. 701,791. 12 Claims. (Cl. 200-139)

2,073,771. REFRIGERATING APPARATUS. Edward Wilson, St. Louis, Mo. Application July 5, 1935, Serial No. 29,775. 24 Claims. (Cl. 62-115)

2,073,833. AIR CONDITIONER. George de Bothezat, New York, N. Y. Application Aug. 29, 1935, Serial No. 38,381. 4 Claims. (Cl. 62-136)

2,073,891. MEANS FOR INTERCHANGING THE FUNCTIONS OF COMPLEMENTARY HEAT EXCHANGE ELEMENTS. Joseph Vogler, Philadelphia, Pa., assignor to Baldwin-Southwark Corp. Application May 31, 1933, Serial No. 673,733. 6 Claims. (Cl. 277-19)

2,073,915. HUMIDIFIER. Ralph P. Willis, New York, N. Y. Application Aug. 16, 1934, Serial No. 740,163. Renewed Aug. 13, 1936. 3 Claims. (Cl. 237-78)

2,073,950. BEVERAGE COOLER. Robert M. Seibert, Littleton, Colo. Application May 2, 1936, Serial No. 77,533. 4 Claims. (Cl. 225-1)

2,074,074. COOLING AND DISPENSING APPARATUS. Albert Roren, New York, N. Y., assignor to Carbonaire Beverage Dispenser, Inc., New York, N. Y. Application July 23, 1935, Serial No. 32,797. 3 Claims. (Cl. 225-40)

2,074,132. TEMPERATURE CONTROL DEVICE. Theodore A. Rich, Schenectady, N. Y., assignor to General Electric Co. Application July 14, 1934, Serial No. 735,226. 9 Claims. (Cl. 200-139)

2,074,137. EVAPORATOR. Harry A. Whitesel, Fort Wayne, Ind., assignor to General Electric Co. Application Dec. 1, 1932, Serial No. 645,255. 9 Claims. (Cl. 62-126)

2,074,256. REFRIGERATING CABINET. Ernest Du Bois, Itterbeek, Chateau de Pierrefonds, Belgium, assignor to International Carbonic Engineering Co., Kennett Square, Pa. Application Sept. 14, 1931, Serial No. 562,810. In Belgium Feb. 10, 1931. 34 Claims. (Cl. 62-91.5)

2,074,265. AIR CONDITIONING APPARATUS. James B. Kirby, West Richfield, Ohio, assignor to Industrial Improvements, Inc., Cleveland, Ohio. Application Oct. 25, 1933, Serial No. 695,135. 9 Claims. (Cl. 261-90)

Reissues
20,300. REFRIGERATOR. Paul C. Warren, Lakeside, Mich. Original No. 1,943,646, dated Jan. 16, 1934, Serial No. 579,878, Dec. 9, 1931. Application for reissue Jan. 14, 1936, Serial No. 59,154. 4 Claims. (Cl. 62-66)

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

G-E Opens Display in New York Building

NEW YORK CITY—An exhibit of electrical products for industry, composed of representative products of General Electric Co. and affiliates, has been opened in the General Electric Building here.

The display covers 7,000 sq. ft. of floor space, and includes exhibits of cable, distribution equipment, fractional-horsepower and integral motors, industrial control, industrial heating and lighting, meters and instruments, police radio, switchgear, transportation products, turbines, and welding.

G-E's incandescent lamp department, air-conditioning department, and the construction material and plastics divisions of its appliance and merchandising department also are represented.

Among G-E affiliates exhibiting are: Trumbull Electric Co., General Electric X-Ray Corp., Warren Telechron Clock Co., General Electric Vapor Lamp Co., Bailey Meter Co., Locke Insulator Corp., and Carbonyl Co.

Adjoining the exhibit room is a conference room equipped for presentation of lectures and motion picture films.

The story of electrical instruments is presented by means of a series of transparencies. Time switches, demand meters, recording instruments, portable instruments, small panel instruments and watt-hour meters are represented.

In the motor exhibit, photographs show the various tests which G-E motors must pass before shipment. Center of the display is an induction motor operating in a glass case within which cement dust is being blown about by a vacuum blower. On either side of this exhibit are tables on which assembled and disassembled motors are shown.

Utility Sets \$140,000 Quota For Sales Campaign

FAIRMOUNT, W. Va.—Monongahela West Penn Power Co. salesmen have set \$140,000 in sales as their quota in the company's annual Frigidaires "Proof Parade," spring sales campaign ending May 8.

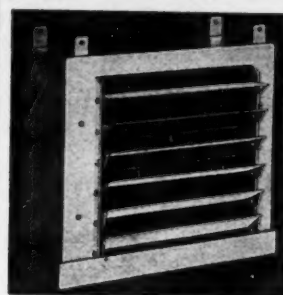
Quota in last year's drive was set at \$100,000, but actual sales during the campaign reached approximately \$170,000. Later in the year, utility salesmen sold another \$115,000 worth of appliances in another drive.

Instead of the company's setting salesmen's quotas, each man this year was permitted to set his own mark. Cash bonuses have been established for salesmen who exceed their own expectations in the drive.

Employee cooperation in the campaign is being incited through the offer of a sheepskin wallet to each employee submitting the name of two prospects who purchase Frigidaires during the drive. Points will be awarded for each employee-prospect sale, applicable toward any of a number of additional premiums offered to Employee Prospect Activity club members.

BUYER'S GUIDE

SPECIAL RATES APPLY TO THESE COLUMNS ONLY
WRITE ADVERTISING DEPT. FOR FULL INFORMATION



UNIT BLOWERS

Pipe Coils
Air-Conditioning Coils

FIN COILS

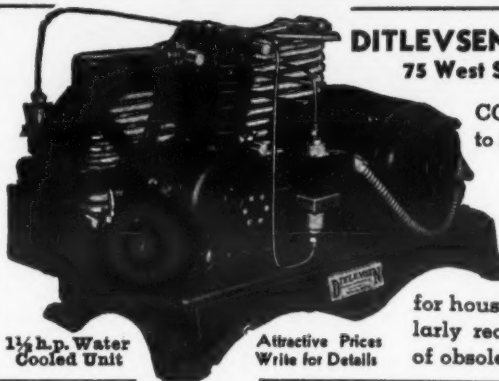
5/8" — 3/4" — 1"

Steel or Copper

REMPE COMPANY

340 N. Sacramento Blvd. Chicago, Illinois

REMPPE



DITLEVSEN & COMPANY, Inc.

75 West Street, New York, N. Y.

CONDENSING UNITS from 1/4 to 2 H.P. Air and Water Cooled.

BARE COMPRESSORS

DIRECT DRIVE CONDENSING UNIT 1/2 H.P. with exceptional capacity

for household refrigerators. Particularly recommended for replacement of obsolete hermetic units.

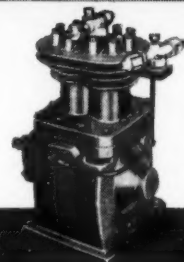
MILLS

COMPRESSORS

for Commercial Use

Mills Novelty Company • 4100 Fullerton Avenue • Chicago, Illinois

REPLACEMENT COMPRESSORS for All Standard ICE CREAM CABINETS



Bare Compressors and complete units (with or without motor and controls) especially adapted to ice cream cabinet installation and for replacement on all standard makes of flooded type or dry expansion systems.

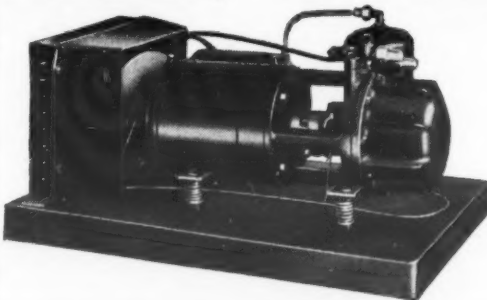
Write for new catalog.

MERCHANT & EVANS COMPANY

Philadelphia, Pa., U. S. A., Plant at Lancaster, Pa.



Revolutionary New Oscillating Compressor!



A life-saver for manufacturers not making their own units! Here's the opportunity for Service Companies to save their customers money and give them a new up-to-minute unit at a lower cost than repairing the old one!

Write for Prices and Details!

O'Keefe & Merritt Co.

3700 E. Olympic Blvd. Los Angeles, Calif.

CHIEFTAIN

QUALITY-BUILT COMPRESSORS and CONDENSING UNITS

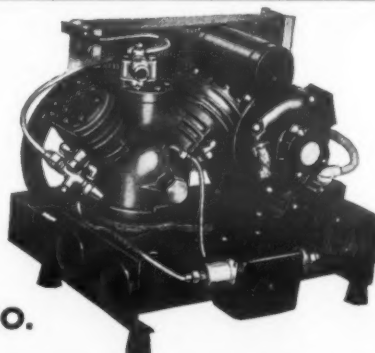
The CHIEFTAIN line represents precision manufacture and proven service, and is designed for all domestic and light commercial applications.

Sizes range 1/2 to 3/4 HP.

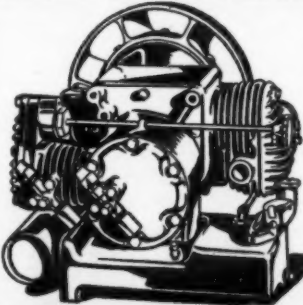
Write for prices.

TECUMSEH PRODUCTS CO.

TECUMSEH, MICH.



ICE ENGINE—Gasoline Powered



Engine and Compressor one balanced Unit designed and built by the largest manufacturers of Gasoline Engines in the World.

Compressor, 2 1/2 x 1 1/2 is driven at 625 RPM, one-half Engine Speed, and is oiled for life. Engine displacement—8.95 cu. in. Compressor—5.96.

Ideal for grocery and delicatessen Cabinets, medium size display and Freezer Cases, Ice Cream Cabinets, Soda Fountains, Milk Coolers; Multiples of domestic Cabinets or small commercial Units.

Price reasonably low, liberal dealer discount.

Send for Free Illustrated and Descriptive Folder

NATIONAL ELECTRIC TOOL CO.

Dept. EN-558 W. Washington St., Chicago, Ill.